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FEBRUARY 1993

MacUser

BUYER'S GUIDE

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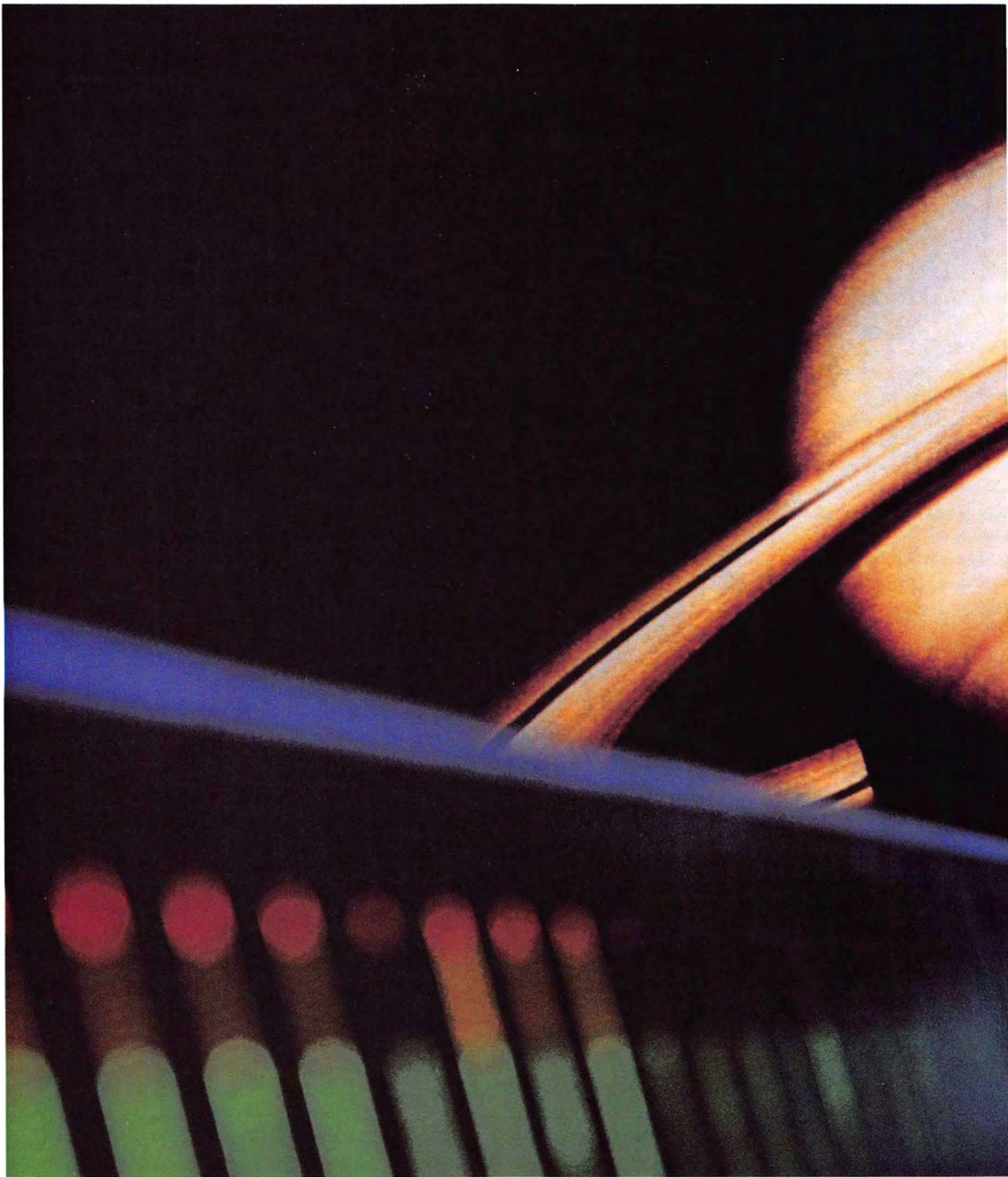
Picking the right
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ultralight models
to the
amazing
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UltraBook!

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- The secrets of 7-hour battery life
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- Survival tips from the experts





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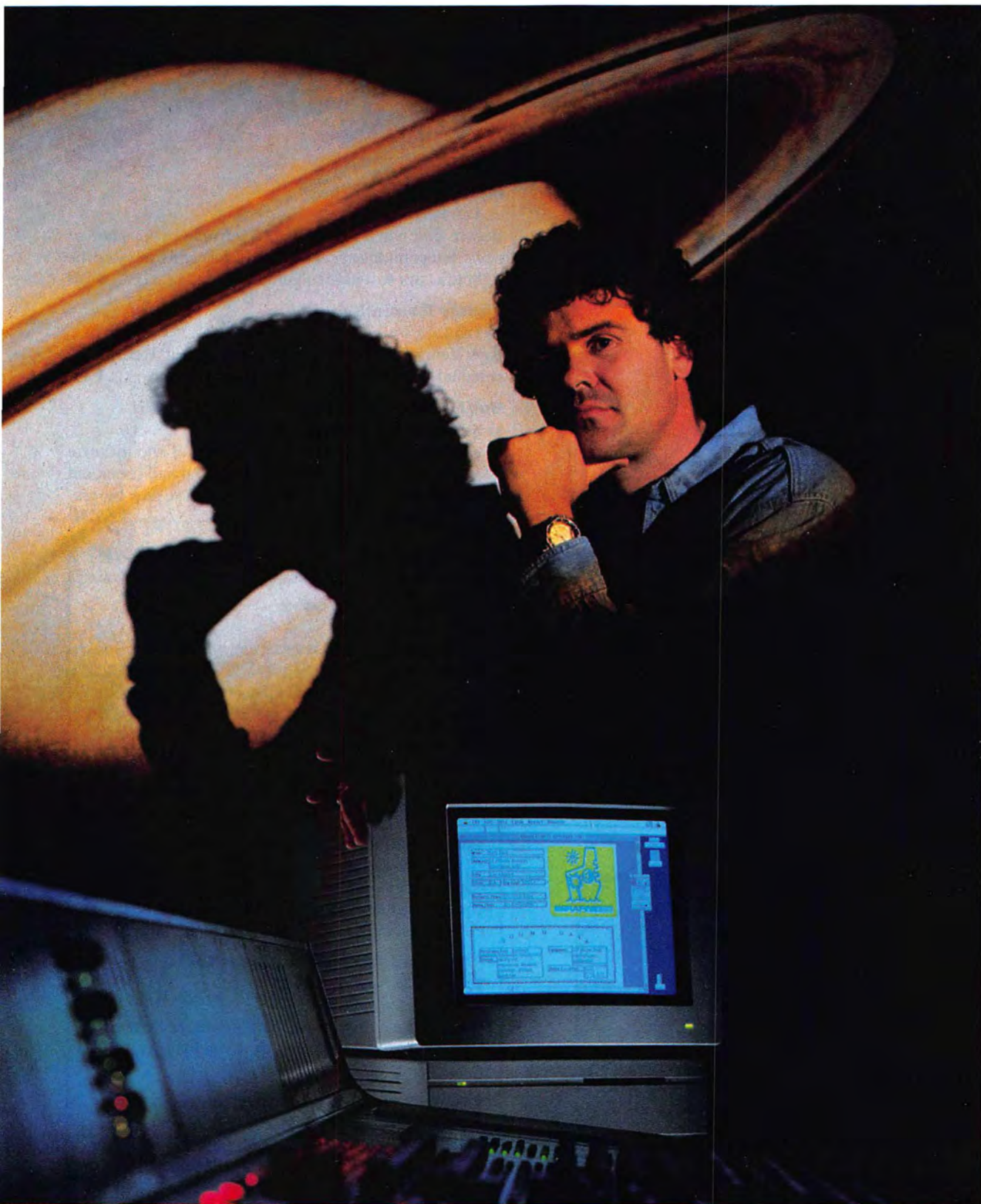
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FEBRUARY 1993

Volume 9 Number 2

On the cover: MacUser's unique custom-created UltraBook is the world's most powerful — and expensive — portable Mac.

Cover photo by Steven Underwood

176
Tiny drives
for your
pocket
or your
PowerBook.



159
Our
UltraBook's
too cool to
buy from
Apple.



112
You'll never miss an
appointment again.



243
Send your E-mail
anywhere —
even to PCs.



168
Field-tested tips for traveling with a PowerBook.

Features

Making Connections

BY TOM PETACCIA

Before you enter the on-line, electronic cyberspace of news, telecommuting, and E-mail, you need to choose the right telecom software to guide you. **100**

Timely Reminders

BY TED LANDAU

New Year's resolution: Get more organized! Here are 16 personal organizers that promise to help you. **112**

Book Excerpt: Gates

BY STEPHEN MANES AND PAUL ANDREWS

If you want to know the inner secrets of the ultimate power user, put down your Excel manual and check out these exclusive excerpts from the explosive new biography of the man behind Microsoft. **130**

Buyer's Guide: The PowerBook Primer

Picking a PowerBook

BY HENRY BORTMAN

With eight models to choose from, which PowerBook offers the trade-offs between light weight, crisp screen, and docking and expansion capabilities that are right for your budget? Here's the answer. **154**

The MacUser UltraBook

BY HENRY BORTMAN

MacUser presents the UltraBook, our color, solar-powered, cellular, streamlined baby. **159**

The PowerBook Survival Guide

BY JAMES BRADBURY

Every traveler knows not to drink the water, but do you know these 25 street-smart tips for practical PowerBooking? **168**



Expanding the PowerBook: 2.5-Inch Hard Drives

BY MARK FROST

We tested ten tiny totable hard drives, both internal and external, to see if they were roadworthy. **176**



Taking Charge: PowerBook-Battery Management

BY BRUCE I. BERKOFF

MacUser Labs discovers which PowerBook batteries and recharging techniques are the best and how to fly across the country on a single charge. **194**



PowerBook and SCSI Display Adapters

BY KATHERINE BARNES

Expand your PowerBook horizons with a display adapter for bigger and better viewing. **210**

Sections



NEW ON THE MENU

..... 45

Apple releases QuickTime for Windows, Adobe removes bottlenecks for faster Photoshop filtering, and SCSI goes cableless. 46



DESKTOP PUBLISHING

..... 215

Prepress

Color comes to the desktop and with it all the complexities of a prepress house. Here's how to handle chokes, knockouts, and other trapping hazards. 217

Step by Step

Here's how to create exotic graphic effects by using PostScript clipping paths as masks. 228



BRIDGES

..... 233

Platforms

Gateways to IBM mainframes: There are lots to choose from, but which gateway you choose may depend on the network strategy you already have in place. 235

Mac to PC

Cross-platform E-mail is just around the corner, and so is the neighborhood bully. 243



PERSONAL MACINTOSH

..... 247

Mobile Mac

The hottest, coolest new pen-based computer is shipping now — but it's not a Mac. 249



POWER TOOLS

..... 255

Beating the System

Bob LeVitus rates four new System 7 utility bundles that promise to make you a power user. 257

Tip Sheet

How to improve ImageWriter output, log in to ARA, and group items in PageMaker. 261

Help Folder

How to get through an airport, print gray scale on a StyleWriter, and generate a Control-key character on a Mac Plus keyboard. 265

This Month on ZiffNet/Mac

Go on-line for the most-up-to-date tax advice, freeware, shareware, and more. 275

Reviews

Microsoft PowerPoint 3.0

A presentation overhaul that's worth the wait. 50

FileMaker Pro 2.0

An easy-to-use database program gains power. 52

Now Utilities 4.0

An indispensable utility collection. 54

InTouch 2.0

Address-book manager gains speed and versatility. 55

MacroModel 1.0

Full-featured, spline-based 3-D modeler. 57

GCC WriteMove II and Kodak Diconix 180si

Peewee printers for PowerBook publishing. 62

MiniCad+ 4

Newly enhanced 3-D architectural tool. 67

Adobe Premiere 2.0

The video-editing favorite goes professional. 71

VideoVision

Flicker-free video output for multimedia mavens. ... 75

DocuComp II 1.0.1 and UpDiff 1.0

Compare differences between document versions. 87

Quick Clicks

CPU-Connectix PowerBook Utilities, Audioshop, Silver Cloud, Diamonds, Personal RecordKeeper, Kid Pix Companion, Magnet, Drive7 and Hard Disk Toolkit Personal Edition, and AccessPC and Macintosh PC Exchange. 91

7th Heaven 2.0, Super 7 Utilities 1.0, System 7 Pack 3.0.1, and Xtras for System 7 1.0

Four System 7 utility collections. 257

Departments

Jon Zilber

The amazing MacBoomBox. 23

Andy Ihnatko

The secret life of implants. 29

Michael Swaine

The hot, the dormant, and the bogus. 41

John C. Dvorak

Detailing System 7. 362

Letters

Readers sound off about taxes, computer salespeople, cryptic acronyms, and ex-vice presidents. 13

Product/Advertiser Index 309

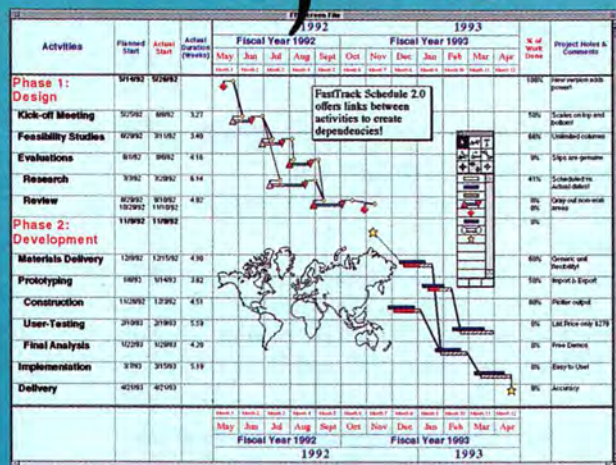
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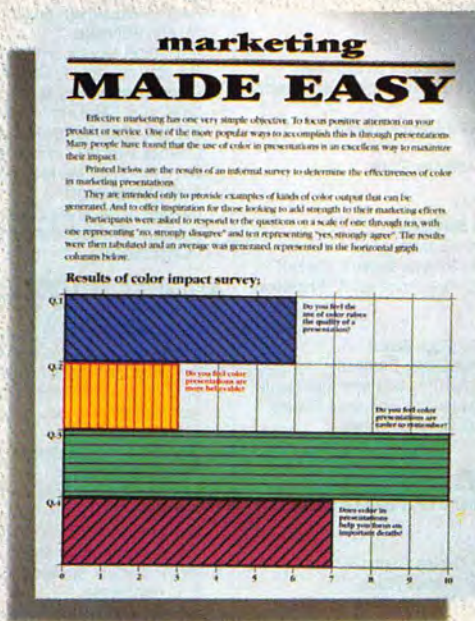
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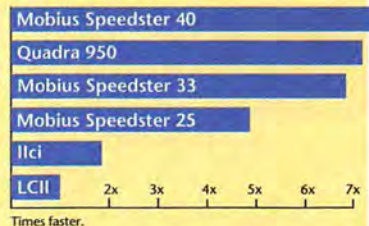
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About

MacUser

Drive Hard, Drive Slow

Sometimes *MacUser's* lab reports require some hard-boiled detection.

Working the hard-drive detail at ZD Labs, project leader Kristina De Nike noticed something odd: The internal 80-megabyte hard-disk drives were a lot faster than the external ones — despite the fact that each drive housed exactly the same Quantum Go•Drive 80 mechanism. The recorded speeds were differing by as much as 58 percent. She put in a call to Quantum. "How can this be?" she asked.

The company's initial guess was that ZD Labs had received a bad batch of drives. This made sense — except for one thing. All the internal drives were consistently and significantly faster than all the external drives. It was just too neat.

There was only one thing to do. Kristina got down to some serious sleuthing. Her first step was to run tests to isolate various drive functions so she could track down the guilty performance-degrading component. A few clues began to surface. She noticed that although all the drives seemed to be getting adequate power, the external drives were subject to more power fluctuations than the internal drives. And she noticed that any fluctuation in power caused a major slowdown. Which meant that — well, we won't give away her explanation, which you can read about on page 186, but we will mention that Quantum later confirmed and corrected the problem.

Meanwhile, ZD Labs' PowerBook-battery-management expert Bruce I. Berkoff pondered the question, Which factor is the most likely to suck the life out of a PowerBook battery? The hard drive? The screen? The microprocessor? Phases of the moon? His investigations led him to the least likely suspect, as detailed on page 200. His discoveries may change the way you work with your PowerBook.

Of course, it doesn't take a detective to determine that the PowerBook line has revitalized not only Apple Computer but also a lineup of third-party companies and the industry at large. From compact hardware (diminutive drives, miniature modems, pint-sized printers) and innovative software (narrow-as-an-arrow word processors) to whole new categories of products (power management, file synchronization) and new issues to consider (remote access, wireless computing), PowerBook is already a billion-dollar business.

To help you find your way through the maze of new products and decisions, we've put together a PowerBook Buyer's Guide, beginning on page 151. It should give you all the clues you need — about everything from PowerBook hard drives to batteries and display adapters — to take the mystery out of choosing the right products.

— Nancy Groth



It was an insight job as Kristina De Nike tracked down the solution to the case of the slow drives.

The ins and outs of speeding up your SE.

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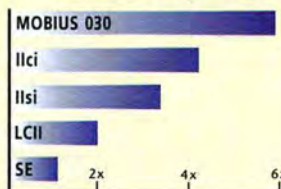


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At last, Hewlett-Packard introduces a laser printer built specifically for the Mac from the ground up—the new LaserJet 4M. A laser printer for Mac users with everything you expect. And, more importantly, everything you need. From built-in PostScript Level 2 software from Adobe and 6 MB of memory, to standard LocalTalk and optional EtherTalk. Features which make certain this new generation in laser printing is ready-made just for you.

The finest print quality in its class.

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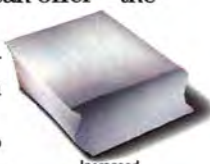
But this wouldn't be an HP-caliber breakthrough if the innovations weren't across the board. That's why, even though the new generation LaserJet 4M printer is built for the Macintosh, it will perform for DOS and Windows users as well... automatically. Automatic

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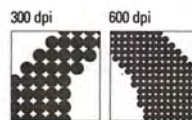
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Perhaps the most remarkable attribute of the new LaserJet 4M printer is the price—\$2,999*. A breakthrough in its own right. So call 1-800-LASERJET (1-800-527-3753), Ext. 7135 to receive a print sample** and comparison disk to see the quality for yourself.† Or visit your nearest authorized HP dealer and see the printer built to add some polish to your Apple.



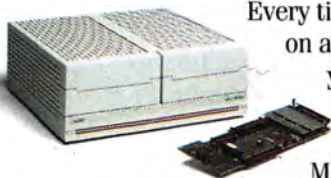
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CIRCLE 164 ON READER SERVICE CARD.

LETTERS



Several readers jumped on John C. Dvorak's categorization of apple as vegetable in his November column. "Apples are fruits, not vegetables," huffs John W. Moore, of Charlotte, North Carolina. Richard Williams, of Milton, Massachusetts, proposes: "If Dvorak wants a name for a new Mac, I suggest The Apple Macintosh John Dvorak Can't Tell the Difference Between Vegetables, Fruit, and Fungi Ha Ha Ivi." Thanks, guys, but even if you've never played "animal, vegetable, or mineral," consider this: *Webster's Ninth New Collegiate Dictionary* defines *vegetable* as "of, relating to, constituting, or growing like plants" — which includes fruit. Or perhaps you'd prefer another definition: "a human being having a dull or merely physical existence."



Write to Letters to the Editor, c/o

MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of



ZiffNet/Mac, our on-line service.

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Death and Taxes

Tax season is approaching, and because I get much of my guidance from you, I am wondering what can be done to avoid another debacle like the one that occurred with ChipSoft's MacInTax last year.

You may recall that ChipSoft bought MacInTax from Soft-View, and your reviews let a radically revised MacInTax off very easily, with comments such as "If MacInTax is as good as it has been . . ." Well, you know it wasn't. The weak program was

coupled with truly unhelpful and arrogant "tech support" (I use the term loosely), and many of us were burned badly.

I know that MacUser was a sometime party to these discussions. Have you revised your testing criteria for tax programs as a result? I can't buy two or three of them in order to decide which is the best — this is where you come in.

Brian A. Bauer
Somerville, MA

It'll be tough to report on the actual performance of tax-software packages until someone invents a time machine. By the time all the various tax schedules are available and people have had a chance to put tech support to the test, it's time to file for an extension. But all is not lost. This year we'll hold a special on-line conference about tax-preparation software from January 25 to 29 on the ZiffNet/Mac Executives On-line Forum (GO ZMC:EXEC). That way you'll be able to read our evaluation and talk to representatives from ChipSoft before you buy.

As we reported in *Personal Best* ("Unhappy Returns," August '92, page 217), MacInTax's and ChipSoft's performance last year was a far cry from the high standards ChipSoft's customers expect. Although ChipSoft now promises to pay any Internal Revenue Service penalties you incur as a result of a calculation error by MacInTax and reports that it has beefed up its technical support, MacInTax's rocky road doesn't appear to be over yet. The company just informed us that a newly discovered bug prevents the program from installing when virtual memory is turned on. — JB

Dear Mr. Sculley . . .

In November we asked, "What jargon would you like to see banished from the Apple vocabulary?" The most direct reply came from Brian Marantz, of Palm Springs, California, whose one-word reply was "Microsoft." Jeremy Roberts adds another M-word to the list: "Multimedia. It's what music and video professionals have been doing for years. Suddenly the buzzword was created, and Apple thinks that'll sell computers?"

"What drives me nuts is graphical user interface, or GUI," says Adam Engst via ZiffNet/Mac, who contends that "user" is implied. "GUI is merely an ugly acronym with a dubious onomatopoeic connection." OTH (on the other hand), Adam wonders if *graphical interface* would deter people from using the acronym, "seeing as GI has several other uses, such as GI tract and GI Joe."

From Edmonton, Alberta, comes this plaintive cry: "What in the world does WYSIWYG mean??? Nobody's ever explained it to me," writes Matthew Ogle. You're not alone, Matthew. Alan Wachtel, of Palo Alto, California, chimes in: "WYSIWYG isn't only an intolerably ugly and insufferably obscure imitation of a word, meaningless to anyone who's never seen it before — it's just plain backward. It should have been WYGIWYS or YSWYG." When it comes to acronyms, what you see is what you get.

"The term I'd really like to see yanked up by the roots before it can propagate further,"

Alan continues, "is *personal digital assistant* (PDA). There is no such thing as a digital assistant, so there can't be a PDA. But there are personal assistants, so there could be a digital personal assistant (DPA). Or, less glamorous but more accurate, call it a personal assistant, digital (PAD)."

"Is it just me or does *personal digital assistant* sound like the type of 'politically correct' 'sound bite' worthy of appearing in a presidential candidate's speech?" asks Yuan Fung, of Sebastopol, California. "And what exactly is Mac's 'collision with system heap' error message trying to tell you? Sounds like your Mac's way of letting you know that it hates your new control panel and the #%&! has just hit the . . . er . . . hard drive."

Finally, Alexander Clark, of Springfield, Massachusetts, writes "Unnecessary jargon is not the only possible anfractuosity collusion in the computer field. Mystification is a major problem." Say what?

If Apple's going to sell Macs through such outlets as Sears, they'll need a catchy jingle, a new slogan, or an anthropomorphized spokescreature like the Pillsbury Doughboy.

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CIRCLE 148 ON READER SERVICE CARD.

LETTERS

Performa Anxiety

Something is amiss. In the text portion of the November '92 Performa article ("Coming Home: The Performa Family," page 53), you state that the Performa 600/600CD is slightly superior in performance to the IICI. However, in Figure 2, the 600/600CD barely beats the IIsi, despite its processor being much faster than both the IIsi's and the IICI's.

Which is correct, the text or the graph? I would sooner believe that a typo occurred in the text than believe that a major error slipped through in a performance-comparison chart. However, I would think that a 32-megahertz processor would beat a 20- or 25-megahertz processor by a mile—which raises the question: What in the name of Woz did Apple do to cripple the Performa 600/600CD?

William Bruchert
Chicago, IL

Change the text from IICI to IIsi, and you've got the answer. We too were puzzled by the Performa's lackluster speed. On paper, it looks as if it should be faster. Apple attributes the difference in performance to processor clock speeds. On the Performa and the IIVx, the CPU runs at 32 megahertz. The rest of the motherboard, however, runs at 16 megahertz (although the FPU and the cache on the IIVx also run at 32 megahertz). On the other hand, the entire motherboard on the IICI runs at 25 megahertz and at 20 megahertz on the IIsi. Had the Performa and the IIVx been all-32-megahertz designs, they would have been a lot faster—and a lot more expensive too. —JB

Housewares, Lingerie, Macs

Yesterday I was at an Office Depot in San Antonio, Texas, looking at the new Mac Performas. Aside from being uneasy because I was actually looking at a Mac display in a big retail store, I also had some serious concerns about how Apple plans to market the Mac Performa line.

The Macs were set up in a pathetic-looking display between the word-processing typewriters and the dot-matrix printers. When I asked store personnel if they knew anything about these new Macs, they said that the Macs were too complicated to run. What? How can a Mac be harder to run than a PC? If you can't learn a Mac in about an hour, you ought to have your driver's license taken away.

I noticed that the store's Performa 400 was running Apple's new extension At Ease. I asked the assistant if he liked the

new extension, and he said he thought that was the Mac. He said he couldn't figure out how to get to the Finder. So, extremely angered by this time, I showed him the complicated way of pulling down a menu to get back to the Finder.

I then noticed a married couple—just the customers Apple is hoping for—looking at the Mac. The husband asked a different sales assistant about the Mac, and the assistant said, "Oh, those aren't very good. They're too hard to run. But this Packard Bell over here is simple. You'll learn DOS in no time."

What do first-time computer buyers think of a Mac if the store salesman can't even demonstrate it? Will they go ahead and buy it? They'll get stuck with some piece-of-crap PC they'll regret buying for the rest of their adult existence simply because the store salesman was an incompetent boob who couldn't show them the beauty of the Macintosh.

Brian S. Jones
San Antonio, TX

Networked Over

Although you attempted to provide a detailed overview of network strategies for the Mac in the October '92 issue, we found your mention of the vendors ("Networking and Connectivity Directory," Buyer's Guide, page 49) that provide the products for those strategies to be very limited.

For example, your mention of file servers for foreign (non-Mac) platforms concentrated only on software that can be installed on the other computer (AlisaShare, uShare) or run on a gateway (GatorShare). You failed to mention that InterCon Systems' NFS/Share and Wollongong's PathWay Client NFS allow Macs to access NFS-based servers over TCP/IP networks. Neither product involves installing software on non-Mac systems, and NFS/Share, at least, supports the traditional AppleShare and Chooser paradigm familiar to Mac users.

Dave Kosiur
Networking Evangelist
InterCon Systems Corp.
Herndon, VA

Quayle Season

In the Letters section of your November '92 issue (page 13), you allowed an anonymous person (on the far-left side of the page, appropriately enough, and left-justified as well) to engage in a little Quayle bashing. Why should this left-

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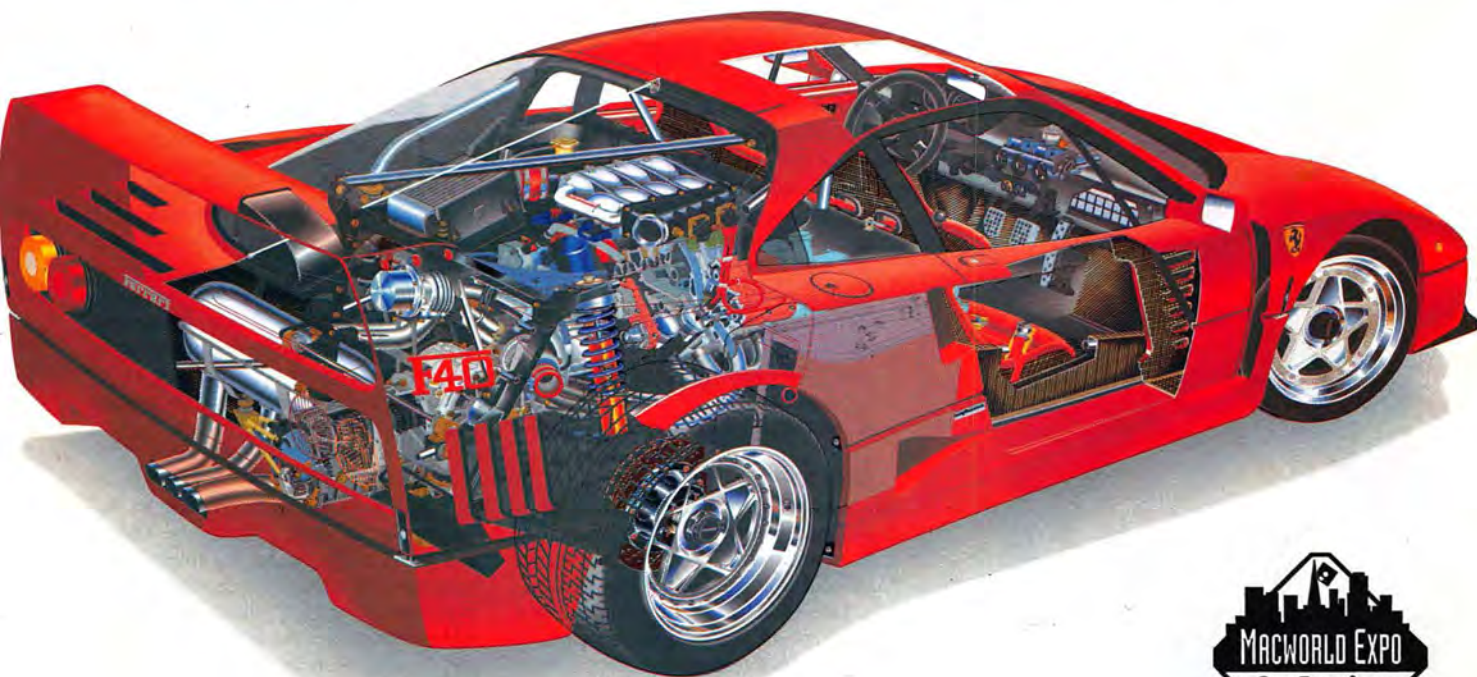
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CIRCLE 74 ON READER SERVICE CARD.

16 February 1993 MacUser

LETTERS

biased person be allowed to publish a hate-filled diatribe in what is supposed to be a politically neutral publication about computers?

Harley Bjelland
Springfield, OR

Although we'd hesitate to equate criticisms of someone's inarticulateness with criticisms of his politics, we do agree that Mr. Quayle is a prominent statesman whose political record should speak for itself. — JZ

Mo' Better Modems

I read with great interest the November '92 article on V.32bis modems ("Bargain Speedsters: V.32bis Modems," page 176). As it happens, I recently purchased a Supra FAXModem V.32bis to connect my home SE/30 with a network at my place of work via ARA (AppleTalk Remote Access).

The network I'm connecting with has a 9,600-bps modem, so I have been using my modem at this speed with ARA. As pointed out in your article, Supra does not bundle a CCL file with its modems for use with ARA. However, ARA does have several modem scripts included with it. I experimented with one — intended for the Hayes ULTRA 96 — and it works fine with my modem. I've been able to use all the features of ARA, including mounting and accessing the hard disk of my office Mac IIci and connecting with the entire network of thousands of users via Microsoft Mail.

Would there be some advantage to having the "correct" CCL file installed instead of the Hayes file? If I were using ARA at a higher speed, such as 14.4 Kbps, would the Supra CCL file be desirable or actually necessary?

Michael H. Kriegel
Woodland Hills, CA

Yes, you do need the "correct" CCL to transmit at 14.4 Kbps with ARA and the Supra FAXModem V.32bis. The CCL is now available on CompuServe, AppleLink, and other on-line services. — SS

Your November review stated that the Zoom FaxModem V.32bis was unable to pass data over simulated impaired rural lines characterized by a long subscriber loop. Our modem has a command, AT/E1, that would have solved this problem. AT/E1 causes the modem to match its impedance to the phone line's impedance, which is important for long phone lines. Understandably, your reviewer did not use this unusual command which, although

mentioned in the manual, is not highlighted or explained very well. We're now drawing attention to that feature in our modem's instructions.

Also we have recently expanded our technical-support staff, added support for faxed-in questions, created a CompuServe forum, and changed our Mac fax software, all with excellent results.

Frank Manning
President
Zoom Telephonics
Boston, MA

The JAGged Edge

In "The Evolutionary War" (November '92, page 43), Michael Swaine's point that magazines are partly to blame for the lack of small, focused applications was made clear 36 pages later in your review of Ray Dream's JAG ("JAG and Smoothie," page 79). From what I gathered in the review, the utility is small, focused, fast, and cheap and does exactly what it is supposed to do. For all this, it gets a wonderful 3.5-mouse rating.

Although you've cautioned readers about the importance of mouse ratings, many cannot read each and every review, and they often rely on your MiniFinders issues and mouse ratings to make a purchasing decision. Products that get 3.5 mice don't usually cut it. Therefore the product will be overlooked and disappear from the face of the earth. If JAG really does deserve only 3.5 mice, then tell me why. Based on the material I read, it deserves 5.

Kevin Shawley
Chantilly, VA

From our point of view, Michael Swaine hit the nail on the head regarding the trend toward smaller, focused applications. Our approach to reviews will evolve accordingly. Under our new rating system, 3.5 mice may not be exactly wonderful, but it's darn good, especially for a utility that is designed for a fairly narrow audience. — SJ

Obtuse Cryptic Reference?

Your review of OCR products in the November '92 issue ("OmniPage Direct and ScanJet IIp," page 75) might have been more informative if you had at least explained what OCR stands for. In the table of contents, the title, the captions, and the entire article, the subject was always referred to as OCR. With so many acronyms in the computer industry, your readers need you to spell them out the

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LETTERS

first time they are used in an article.

Barbara Carey
San Mateo, CA

As this month's "Dear Mr. Sculley" points out, even spelling out acronyms for such terms as "optical character recognition" doesn't always clarify the situation. — PP

By Any Other Name

Mr. Dvorak seems to be critical of Apple's choice of names in the first place ("The Game of the Name," November '92, page 362) and suggests that when technology changes, it's incumbent upon the manufacturer to change the name of the product line. Changing technology surely doesn't beg for changing names. Ever since its inception, Apple has embodied the image of computers for noncomputer people. Millions of dollars have been spent preserving that image. There is absolutely no justification for Apple to change the company name or the association of that name with future product lines. I have owned five Ford Thunderbirds. Technically, my 1978 T'bird was worlds apart from my 1990 T'bird, but they are still properly called Ford Thunderbirds. There is nothing wrong with calling a future Apple Macintosh an "Apple Macintosh."

John W. Moore
Charlotte, NC

As a Mac lover from way back, I must say that John Dvorak is wonderful! He's always on target. His November '92 comments had me rolling in the grass on my lunch break! Given that any issue's Letters department usually has disparaging comments about this guy, please add mine to the other end of the lever.

Darryl Wally
Pittsboro, NC

Time Is on Their Side

I was surprised to see that several advertisements in the November issue mentioned PowerBook Duos, 160/180s, and the Ilvi/vx. MacFriends even priced a Ilvi package. I assume that the deadline for placing the ads was several months earlier. Won't these companies get into hot water over this, or is it too close to the launch date to matter?

Karim Sarkis
via ZiffNet/Mac

I'm disappointed! Usually *MacUser* is well ahead on Mac announcements and

significant items, but your latest issue (November '92) is late on the announcement of the "new Macs." Brochures were available at our local department store (Sears) almost two weeks before the arrival of my copy of *MacUser*. The Performer 400 was on display and being sold last week before my issue arrived! Queries to friends produced the same blank looks as did the pages of *MacUser*. Is *MacUser* that slow, or is Apple that fast?

Bob Spender
Lake Peekskill, NY

We'd be delighted if Apple would schedule its product introductions to correspond to our publication dates, but we aren't holding our breath. Because Apple gives us access to new Macs far enough in advance to do extensive benchmark testing, we in return agree not to report on the results until the first issue after the announcement date.

MacFriends, on the other hand, isn't an Apple Authorized Dealer and as such isn't bound by Apple's rules. The Portland, Oregon-based company says that it gets its product information from "many sources" and tries to time its ads with projected product releases. In the case of the Ilvi, which is now available only in Europe, they were wrong. — PP

Clarifications

In "Finding Good Help" (Personal Best, December '92, page 235), the correct numerical translation of 800-SOS-APPLE is 800-767-2775.

In the Best PowerBook Accessories category in December's "The MacUser 100" (page 93), the correct price for Apple's PowerBook carrying case is \$75. Also, the address and phone number for I/O Design, maker of Ultimate Notebook cases for PowerBooks, should be P.O. Box 156, Exton, PA 19341; 800-241-2122 or 215-524-7277. And in the Games category, the number for Reactor, publisher of Creepy Castle, should be 312-573-0800.

The correct phone number for Ky-Zen Corp. ("Power Tools," December '92, page 253) is 609-354-3863.

In the December review of Autodesk's Generic CADD 2.0 (page 56) we incorrectly stated that the program includes Microspot's MacPlot plotter driver. Generic CADD 2.0 does support all user-installed chooser-level plotter and printer drivers.

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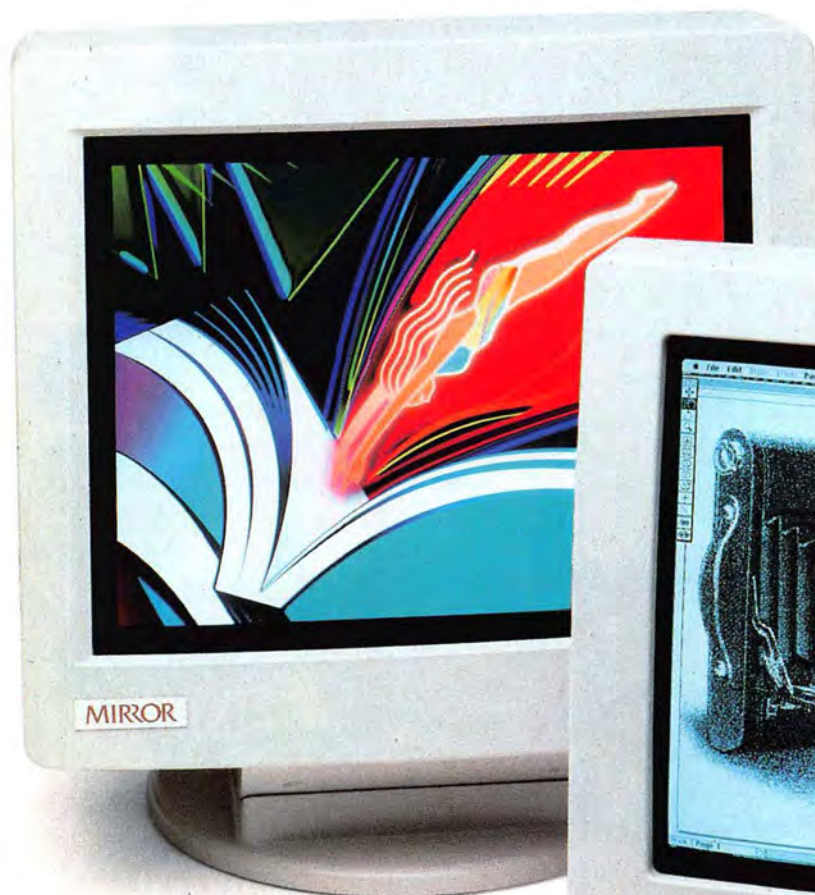
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w/4 MB of RAM	\$999
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w/16-bit board	\$1449
w/24-bit board	\$1549
20-inch ProView Trinitron	
w/8-bit board	\$2499
w/16-bit board	\$2599
w/24-bit board	\$2699
20-inch ProView V	
w/8-bit board	\$1799
w/16-bit board	\$1899
w/24-bit board	\$1999

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perfect for Mac Plus, Classic II or PowerBook	\$699
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The Mirror Grayscale Portrait Display.

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The Mirror Power Vision video adapter for the PowerBook 140, 145 and 170, displays 256 colors on a 13/14-inch color display or 16 shades of gray on a 15-inch full-page display. It features dual-screen and presentation modes, and includes a comprehensive installation videotape.



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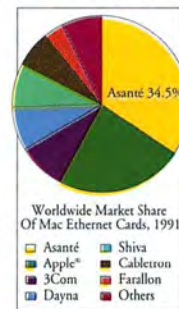
The security software assigns passwords to any or all of your connected LocalTalk devices, and even allows you to specify passwords for specific LocalTalk classes such as color printers or dial-out modems. So you can protect peripherals from unauthorized or accidental access.

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Asanté™ has a reputation for producing compatible, reliable networking products. We offer a full family of best-selling Ethernet and Token Ring® adapter cards for PCs and Macs®. And a full line of intelligent and non-intelligent 10BaseT hubs. Now we're taking Ethernet all the way to your laser printer.

AsantéPrint. The latest innovation in Ethernet solutions from the company with all the right connections.

Resellers: Asanté products are available from Ingram Micro, Merisel and Tech Data.



Source: International Data Corporation, June 1992

Verging on Convergence



Imagine a dream machine that replaces your PowerBook, subs for your cellular phone, and ends your daily commute. It's just down the road.

When it comes to computers, you don't want much. Naturally, you'd like a machine that's powerful enough to handle whatever challenges you might throw its way and expandable enough to accommodate whatever extras you decide to toss in later.

You'd just as soon have a portable machine, but you want all the capabilities of a desktop system — including a keyboard big enough for fingers older than a toddler's and an integrated mouselike device.

You want the simplicity of the Mac and the convenience of compatibility with ubiquitous DOS applications and data files.

Because it's a portable device, you'll be taking it home with you, so you'd like color and multimedia capabilities for the kids. Because it's a portable device, you'll be taking it on the road, so you'd like the anytime-anywhere convenience of cellular communications, for both data transfer and voice telephony. And because it's a portable device, you'd also like to be able to hook up to all the resources and other people's machines available in your workgroup network.

So far, so good. Sounds like a souped-up PowerBook outfitted with the appropriate software and hardware options. This month's "MacUser PowerBook Primer" can help you choose the model that best fits your needs. (That might include some of the more exotic options, such as the ones we've collected and squeezed into our \$14,776.85 UltraBook.)

But that's just the start of your wish list. You've heard about Kodak's new Photo CD players, the ones that convert all your snapshots into digital format on CD-ROM so you can play them back on your TV. And you've been eyeing those new CD-ROM-based video games; a suitably equipped PowerBook would be the ideal base station for a game player that would be the envy of all the kids on the block.

Problem is, you want it all in one box. You don't want to buy a CD player for your stereo system (and a second one for your car), a Photo CD player, a CD-ROM for your PowerBook, and a CD add-on for your Sega or Nintendo. And don't forget you'd like to be able to play full-sized videodiscs too and play back on your TV, which is controlled interactively through your Mac.

So far you need six optical drives, and we haven't even gotten to the writable drive you need for storing those massive digital-video

files you'll be creating in your home multimedia-editing suite.

What you want, then, is one portable box that's small enough to take from home to office to hotel, plop on the passenger seat of your car and connect to your car stereo, and carry around in your briefcase (make that pocket) throughout the day. You don't want to have to keep disconnecting and reconnecting a nest of wires and cables all day long, so your computer will need a single-plug interface or, better yet, a totally wireless one. Of course, you won't want to have to keep changing batteries in the middle of an important cellular call (or just as you've reached level 23 of SuperMarioPro II Deluxe), so it will need to hold a charge for at least a full 12-hour work/play day.

What you want is simple: the computer equivalent of a boom box. A single, portable, self-contained unit that does it all.

Wanted: The MacBoomBox

It's inevitable.

The fields of consumer electronics, communications, and computers have been on a collision course for years. If you listen closely, you can almost hear the impending metallic screech of digital devices crashing head-on into one another, with old ways of working and backward-thinking companies being casualties of the impact.

The signs of convergence are everywhere. Here are a few random sightings:

CD-ROM. Turbo Technologies, maker of TurboGrafx video-game players, recently launched its Turbo Duo CD-ROM-based game system. What differentiates the \$300 Turbo Duo from competing CD-ROM game systems is that, with the addition of a low-cost interface kit, it's a fully functional (if a bit slow) CD-ROM player for your Mac (or PC).

Sony's new Multimedia CD-ROM Player takes a different approach. It is about the size of a portable audio-CD player, and its sole function — right now — is to play back self-running CD-ROMs (and audiodiscs). Although it has an LCD display, a speaker, a full keyboard, and cursor buttons, the Multimedia CD-ROM Player lacks the functionality of a general-purpose computer — nothing that couldn't be fixed by the addition of a few chips and a little I/O circuitry.

Palmtop computing. Just how small do you want your MacBoomBox to be? How

about the size of a Nintendo Game Boy? A company called Fabtek has announced the WorkBoy, a tiny \$80 add-on for the Game Boy that adds a keyboard and some basic applications such as a scheduler and address book, along with

DOS-class computer capabilities. Substitute Mac ROMs, and you'd have the affordable personal digital assistant that Apple so desperately wants you to want.

But the hottest thing right now in mobile miniature devices goes even further.

Mobile communications. The new EO Personal Communicator (see this issue's Mobile Mac department) is a small pen-based tablet that does just about everything you wish Apple's forthcoming Newton devices will do — except connect (easily) to a Mac — and it does it with elegance to spare. The EO devices offer a variety of notepad capabilities along with some impressive communications functionality. The latter should come as no surprise, however, because chunks of EO's funding and technology come from AT&T.


Videoconferencing. Speaking of AT&T, the telephone giant responsible

**Soon computer
videoconferencing will
come standard
with your computer.**

for many of the basic technologies that made the personal computer possible has been selling stand-alone videophones since last year. But many other companies — including telecommunications giant Northern Telecom — have taken a computer-based approach to videoconferencing, creating systems that integrate live-video input with the ability to share and mark up screenfuls of computer information.

With critical stumbling blocks such as compression and high-speed data transport falling in price, it won't be long before computer videoconferencing comes standard with your computer: A small video camera will be mounted in your monitor's bezel, and the necessary video-compression circuitry will be built on to the motherboard.

Not only is videoconferencing a good time- and money-saving idea but it may also soon become the law. In some states (such as California), regulators are looking toward mandatory telecommuting to reduce the unacceptable traffic jams, air pollution, and energy costs of the daily commute; big businesses may soon be required to invest in videoconferencing to meet quotas requiring that a certain percentage of employees work at home.

One-box shopping is coming. The \$64,000 question is which logo will be on the box — Apple, Nintendo, Sony, or AT&T? That depends on which firm best understands the urge to converge. 

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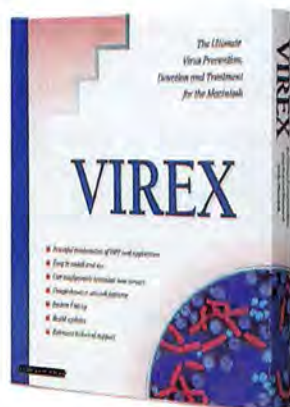
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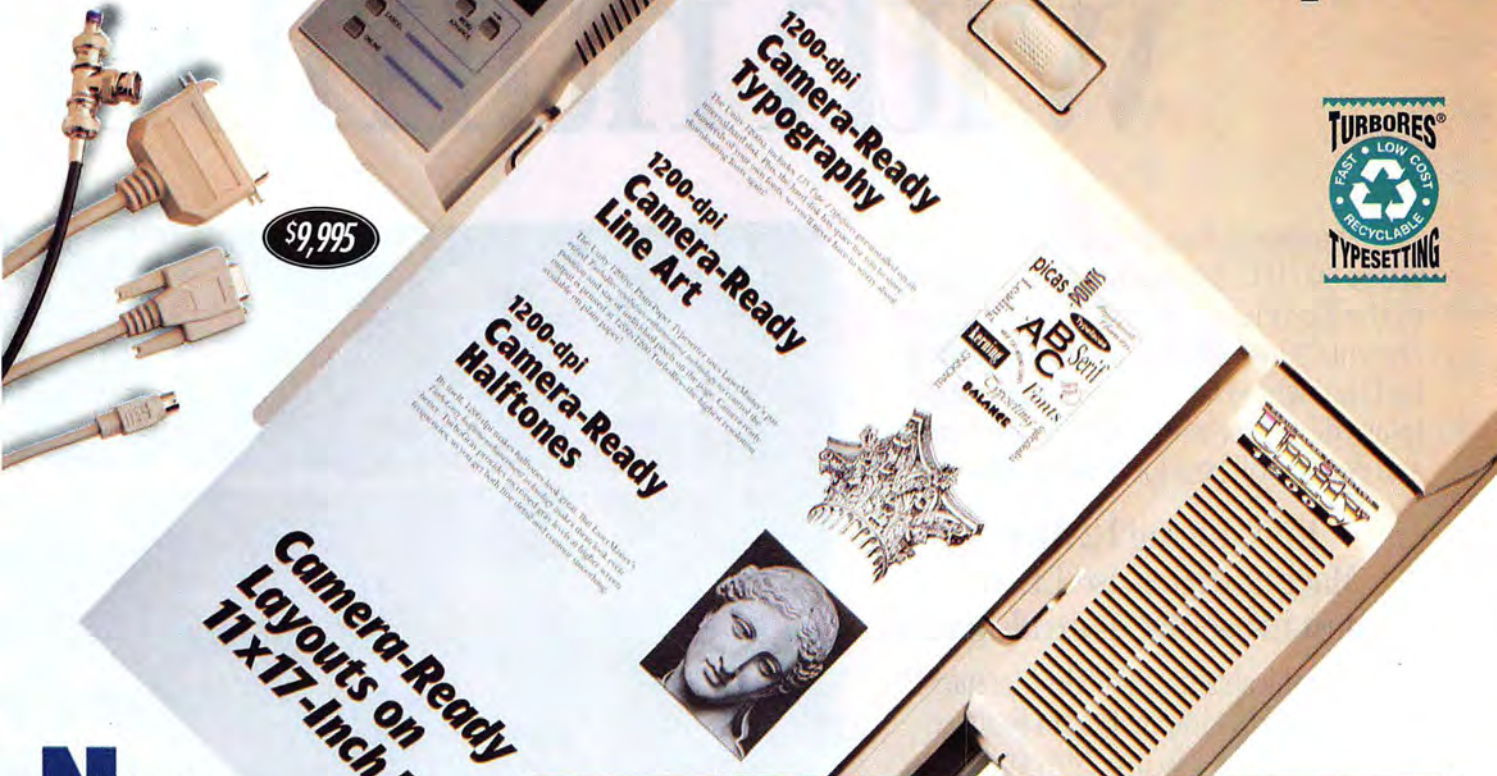
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CIRCLE 179 ON READER SERVICE CARD.

It's been centuries with number

The abacus first appeared around 500 or 600 B.C. Some say it was invented by the Egyptians. Others think it was the ancient Chinese. But whoever it was, they had the right idea: create a simple, easy-to-use device for working with numbers, and people will be a lot more productive.

Introducing 1-2-3 for Macintosh Release 1.1: the easiest-to-use Mac® spreadsheet.

Like the abacus, 1-2-3® for Macintosh® was inspired by simplicity, and Release 1.1 is even simpler to use. Now you can drag-and-drop data between worksheets. And with new SmartSum, you can simultaneously sum multiple ranges. Plus, Copy Down, Copy Right and Copy Back enable you to copy labels or formulas across columns, rows or 3D worksheets.



New graphing enhancements in Release 1.1 let you turn your numbers into graphic presentations faster and easier than ever.

Of course, 1-2-3 is still the only spreadsheet that gives you In-Cell™ editing, so you can enter a formula directly into a cell for faster, easier editing.

The easiest graphing of any Mac spreadsheet.

1-2-3's remarkable graphing and charting capabilities make it the best Macintosh spreadsheet for presenting data. Because unlike Microsoft® Excel, 1-2-3 lets you store your graphs and charts in the same file as your worksheets. So you can manipulate data, text and graphics all in the same file with *one* set of menus and only *one* set of tools. And you can make one-click graph type changes, pull objects across window boundaries to the

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es since working s was this easy.



**True 3D makes organizing
and analyzing data fast and easy.**

Only with the true 3D capabilities of 1-2-3 can you easily consolidate multiple spreadsheets into *one* file without having to link the files. 3D allows all spreadsheet functions to be performed *through* multiple worksheets just as they are performed down rows and across columns.

**The easiest transition
from DOS to Mac.**

For DOS spreadsheet users moving to Macintosh, 1-2-3 is the only way to go. 1-2-3's traditional Classic® Menu makes it easier for you to access familiar 1-2-3 commands and to run macros already written for 1-2-3. And only 1-2-3 offers cross-platform capabilities, so you can work more efficiently and productively with the 18 million other 1-2-3 users

across all major platforms.

worksheet, dynamically link chart titles to cell contents, and shrink charts so they appear as small icons on your worksheet.

Now Release 1.1 takes these graphing capabilities even further. Like the ability to paste pictures behind your graphs, stack pictures to form bar charts, and view your graph source data by scrolling up the bottom edge of your graph. You can even resize chart text simply by using the mouse to drag the handles.

1-2-3 for Macintosh. All in all, it's the easiest way to work with numbers to come along in centuries. To find out for yourself, buy a copy from your Lotus Authorized Reseller,* and try it for 60 days with a full money-back guarantee direct from Lotus.® Or call **1-800-TRADEUP, ext. 7311**** for a free working model. (Excel users be sure to ask about our special upgrade price.***)



Lotus 1-2-3 for Macintosh

Your Mac can say a lot about you.

If somebody sat down at your Mac and started snooping around your disk, which would embarrass you more?

The details of your love life? Your resume? Your adjusted gross income?

How about the Confidential Employee Evaluation you were working on when the Boss hauled you into his office for a chat?

What? You never thought about this before? Then read on and you'll never have to think about it again.

All you'll have to think about is your password.

That's the key to DiskLock™, the painless, yet powerful, System 7 savvy way to keep other people's noses permanently out of both your personal and professional data.

You can password-protect selected files, folders or your entire hard disk. And encrypt everything to U.S. Government DES specs.

You don't even have to be there. DiskLock blanks your screen and secures your system for you — without interrupting your applications — whenever you wander off.

When you return, it asks for your password and lets you know if anyone got curious while you were away.

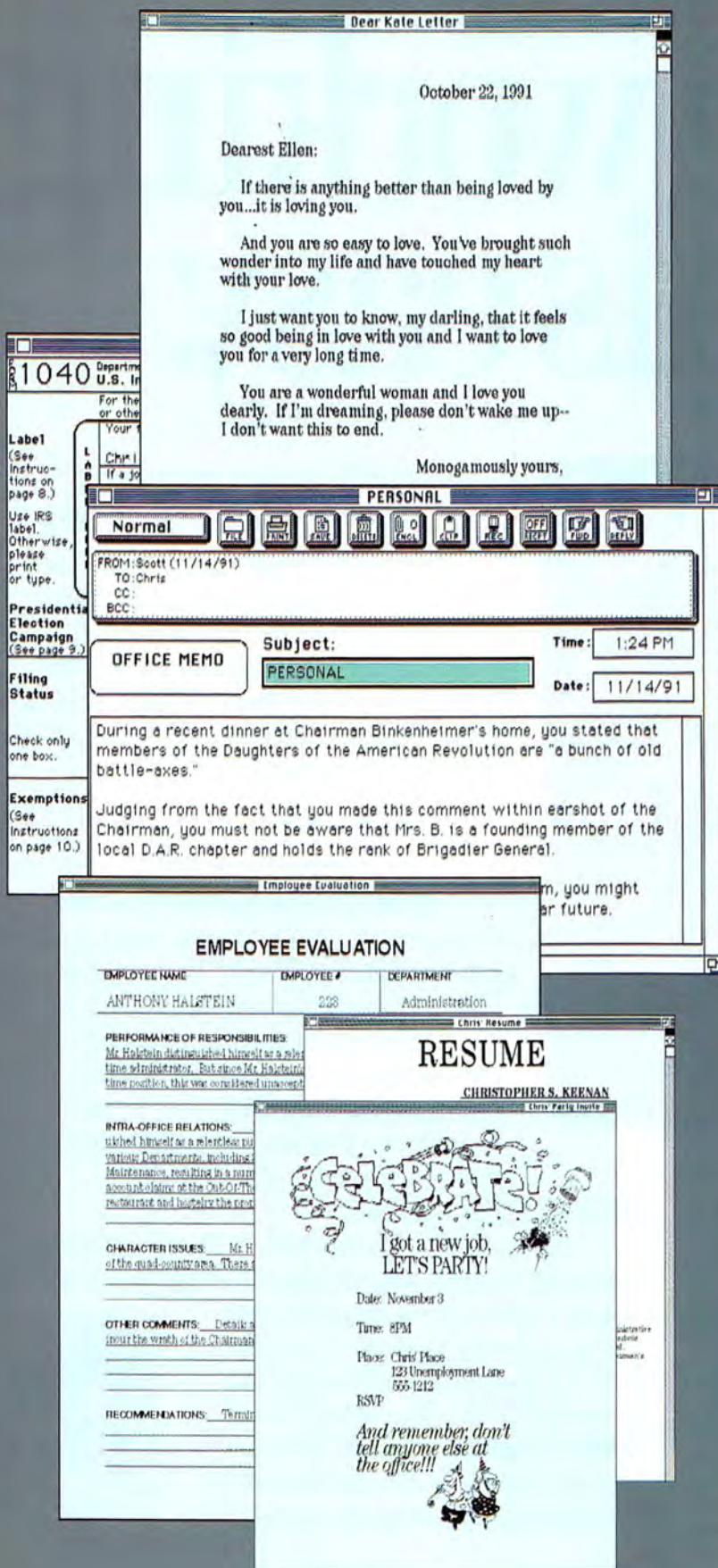
If you're curious about DiskLock, or about our one-year money-back guarantee, call 1-800-666-2904.

We'll give you all the juicy details.



FIFTH GENERATION SYSTEMS, INC.

CIRCLE 106 ON READER SERVICE CARD.



Money Talks



Before you pick up the phone to order that new utility by mail, find out why only some products get "special" treatment.

A scene from *Star Trek VI*: Spock and Chekhov are pursuing the suspected assassins of the Klingon High Chancellor through the decks of NCC-1701A. The chase reaches a dramatic conclusion when one of the assassins trips over the Energizer Bunny and crashes headfirst into a large illuminated Coke machine. Spock then discovers the critical piece of evidence in the investigation: a pair of magnetic gravity boots bearing the Nike logo.

I really hate those advertising implants. Thank goodness none of us here at *MacUser* would ever engage in that sort of thing. Too bad you can't say the same about some of our advertisers.

Leaf through the multipage ads and catalogs put out by mail-order vendors such as MacConnection and MacWarehouse. Ever wonder why certain products have been singled out with photos and full commentary in the ad whereas others get a simple one-line listing? Why only *some* products get the full-page treatment in the catalogs? It's not because they're recommended highly or because the company is crammed to the gills and wants to unload the stuff. No, it's much simpler than that: In the ads and catalogs of most major mail-order vendors (MacConnection, MacWarehouse, MacZone, and Mac's Place, to name some), most of the highlighted products you see are in fact advertisements of the product suppliers, bought and paid for by the suppliers themselves.

For Linda Kaplan, head of Thought I Could Software, publisher of the popular utility Wallpaper, these ads-within-ads are a source of some frustration. "The public feels that if a product isn't mentioned in those ads, it isn't recommended, and also many people believe that it isn't carried by these resellers," she told me. "The product needs to be seen in those ads for many people to know it's available." For Linda to get anything beyond a simple line-item entry in one of MacConnection's catalogs, however, she's going to have to cough up at least \$5,500 (at this writing) for one insertion. The mail-order companies are willing to accept product instead of actual cash, but if Linda sells copies of Wallpaper to MacConnection for \$30 apiece, MacConnection will have to sell 183 copies during the life of that catalog before Thought I Could makes a single dime.

What do I think about this? Well, speaking strictly as a consumer, I think it's great. I

want to be able to place an order at 2 A.M. I like getting next-day delivery for just a few dollars. I want to call during the busiest time of the day and talk immediately to a real human being who can help me find the product I need. The reason so many mail-order companies can afford to provide services such as these is because they make a considerable amount of money selling space in their ads and catalogs.

Putting personal greed aside, though, this sort of advertising truly bites. First and foremost, it's misleading to consumers. Ads and catalogs that sublet space should bear the same warning that is slapped on game shows: "Some products are featured in this catalog in exchange for paid compensation." Second, it's quite a burden to those I consider to be the backbone of the industry: smaller companies that have only one or two small but unique products.

Card Tricks

On now to another sales practice that sticks in my craw. When a salesperson in a computer store asks if you want one of its free Preferred Buyer's Club cards that entitles you to special mailings, a discount on all purchases, and bimonthly foot massages administered with aromatic oils, they're not just being nice. They're assembling data for a mailing list that can be sold to anyone they want, for however many times they want, and for however long they want.

Proof of this lies in the fact that I now receive about a dozen pieces of mail each month addressed to *Xavier's School For Gifted Youngsters*, a name I made up when filling out a membership form for one of these cards a few months ago. Of course, this was no surprise, judging from the sort of questions they put on the form: What did I do for a living? What sort of software did I regularly use? Generally, which software and hardware products did I plan to buy? And the kicker: How much did I usually spend per year on software? Anytime anyone asks for more than your name, address, and rank, you have to assume you're about to set into motion a complex chain of events that will ultimately result in your mailbox crashing to the ground and taking bits of your home down with it.

A company that sells information about its customers without directly informing them at some point is, in my humble opinion, a

GIMME FIVE!

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GRACELAN Update Manager lets you update software and files remotely in "intelligent" packages you create by adding as many files and folders as you want. These packages can then be distributed to one or many network users all at once. You'll save time and hassle.

2 ELIMINATE PAPER FLOW

With automatic document distribution, you can send regular reports and information to many people at once, right when you need to. No need to tie up laser printers, waste paper, or worse yet, wait in line at the copier. You'll eliminate unnecessary paper flow.

3 REDUCE SOFTWARE PIRACY

With GRACELAN Update Manager, you can control the distribution of software and send out updates as soon as you get them. This helps keep users from unauthorized software usage, allowing you to keep a handle on potential software piracy.

4 REDUCE NETWORK TRAFFIC

Eliminate network traffic caused by sending updates via E-mail systems or copying new versions from the servers. With GRACELAN Update Manager, update packages are automatically compressed and can be sent from your Mac at any time—you can send them during "off" hours, when network traffic is at a minimum.

5 IMPROVE NETWORK MANAGEMENT

GRACELAN Update Manager will improve your network overall. Not only can you keep all users current with the same versions of software, you can perform remote maintenance tasks, such as deleting, renaming, or moving files. This makes it easy to clean up potential problems on users' machines.

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legion of weasels. Be sure to give yourself a fake company name or middle initial so you can track the migration of the data you provide, and then gather up all the resulting junk mail and drop it on the culprits' heads later on if you discover they lied when they told you the data was for internal use only.

Here's a final piece of personal advice: I never give out my home telephone number on forms like those unless there's a *specific* reason why they'd need it. Like most right-thinking Americans, I find unsolicited phone calls roughly 1.29×10^{23} times more annoying than junk mail, and ever since I signed up for Caller ID, evidence of my reaction to such dinnertime intruders can be found in dozens of shallow graves throughout Eastern Massachusetts.

Monitoring Apple

I've got a real doozy of a story for you. Hunter DuBose was the proud owner of an Apple 19-inch color display, which a client purchased for him as payment for services rendered. The monitor turned slightly—I say slightly—wonky. The convergence fell off a bit, a few pixels dropped out, there were some wavy lines, but on the whole the monitor was in OK shape. Still, it was under its original warranty, so Hunter decided to have the thing serviced before it was too late.

As it turned out, this was a big mistake. Several months later, the monitor was *still* in the hands of his friendly Apple service provider, being tweaked and prodded. Every test and adjustment was performed and every component except for the CRT itself was tested and replaced, and the screen was left in worse shape than it began.

Hunter is quick to defend his local Apple dealer, who he says was in constant contact with the mother ship in Cupertino requesting test materials, authorizations, and the usual assortment of equipment and papers that causes things to happen. Ultimately, word came from the contact: Try one more specific thing, and if Hunter's monitor still didn't work, Apple would just replace it.


Well, the thing was tried and the thing failed. There was nothing to do but inform Apple and await delivery of a shiny, new (and free) replacement. Weeks passed. There were more phone calls. Things continued not to happen. Finally, a missive from the mother ship: If Hunter would sign a nondisclosure agreement

(therein promising not to discuss the problems he had had with his monitor or the fact that Apple had fixed it for free), he would receive his promised new monitor. If not, well, Apple Computer might—just *might*—elect to just keep on working on his old one, at its discretion, as spelled out in the warranty.

Hunter offers a possible explanation for this: When he called his Cupertino contact, she told him ominously, "We know about the Apple 8•24 incident." See, he owned one of those doomed Apple 8•24 accelerated-video cards... originally its cdev didn't work with System 7, and when a compatible control panel was released, it slowed down Hunter's system. When Hunter complained to Apple about the slowdown, they gave him a refund on the card. He then posted news about his dealings with Apple and the ultimate outcome, in a message on America Online.

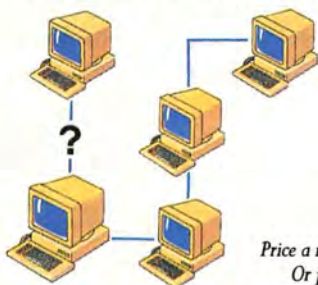
It's entirely possible—I certainly don't want to leap to any conclusions here—that Apple wanted to avoid a replay of The Apple 8•24 Incident and was, in effect, holding Hunter's monitor hostage. Hunter balked, wary of signing any piece of paper that would limit his right to free speech.

Suffice it to say, he didn't get his new monitor. That's the end of the story at this writing. It looks like he'll be getting it anyway—as ownership of the monitor was never officially transferred to Hunter, Apple is now trying to get his client to sign the nondisclosure agreement as the owner of the hardware in question. His client, Hunter says, will probably comply.

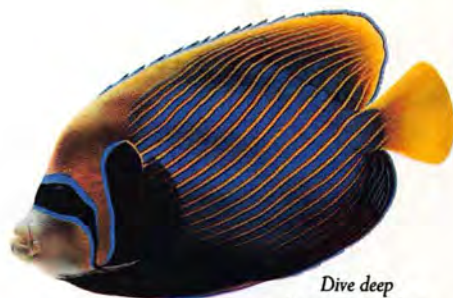
Morals? Lessons? I have none. But I do have two things to say before calling it a day: First, this whole mess would appear to be an isolated incident, mostly the cause of one person at Apple and not a formal policy of any kind. Although I was able to confirm the details of Hunter's story, I was unable to find another case even similar to his. The adventures he and his local dealer had in communicating with the mother ship is another matter and will probably be the subject of another column entirely. Second, I think we have another bit of evidence that although our Lord Apple is a kind and benevolent god, showering its followers with the radiance and universal harmony of really neat hardware and software, it is a god that occasionally bollixes things up incredibly. 

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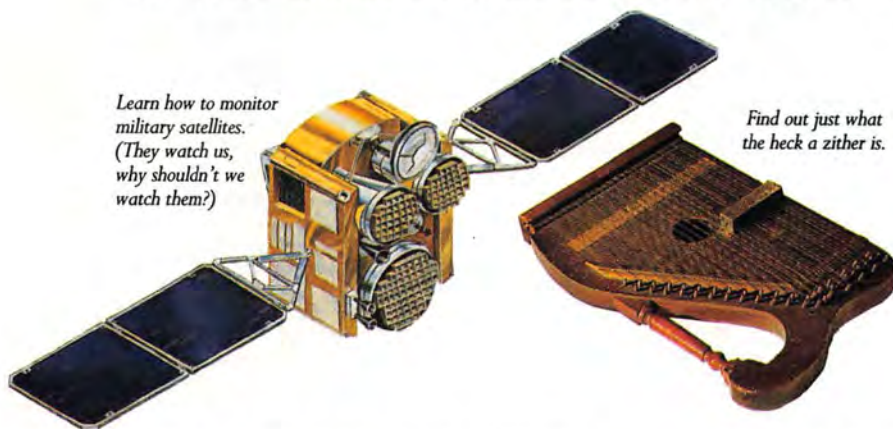
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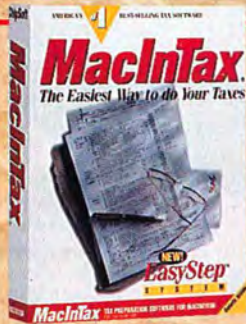
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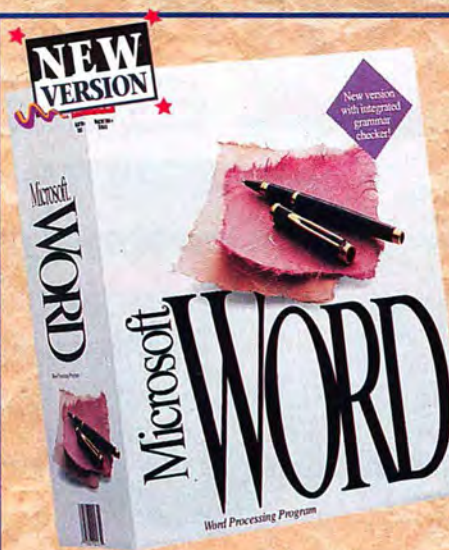


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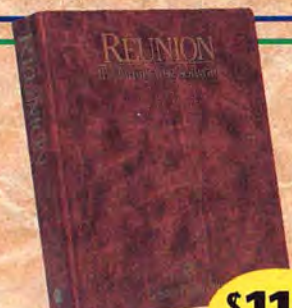
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Classic		Classic	2	2	1	03824 \$ 118
		Classic	2	4*	1	05653 \$ 98
Classic II LC/LC II		Classic II	2	4	1	05653 \$ 98
		Classic II	2	6	1	05655 \$ 178
		Classic II	2	10	1	05656 \$ 349
SE/30		SE/30	8	8	4	05653 \$ 392
		SE/30	8	16	1	05654 \$ 698
		SE/30	8	32	2	05654 \$ 1396
Mac II, IIfx		II	8	8	4	05653 \$ 392
		IIfx	8	16	1	05819 \$ 698
Mac IIfx/cx		IIfx	8	8	4	05653 \$ 392
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		PowerBook 140/170	1	6	1	05392 \$ 238
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		Quadra 700	4	20	1	05654 \$ 698
		Quadra 700	4	68	4	05338 \$ 3,112
		Quadra 900/950	16	8	2	05653 \$ 196
		Quadra 900/950	16	16	8	05653 \$ 784
		Quadra 900/950	16	64	8	05654 \$ 5,584
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	Remote	\$114
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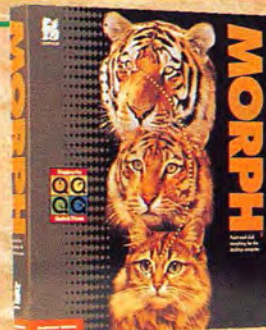
#05973	Ocean in Motion	\$124
#05311	Clip Media	\$288
#06279	Industry at Work Clip Media 2	\$198

Clip Art

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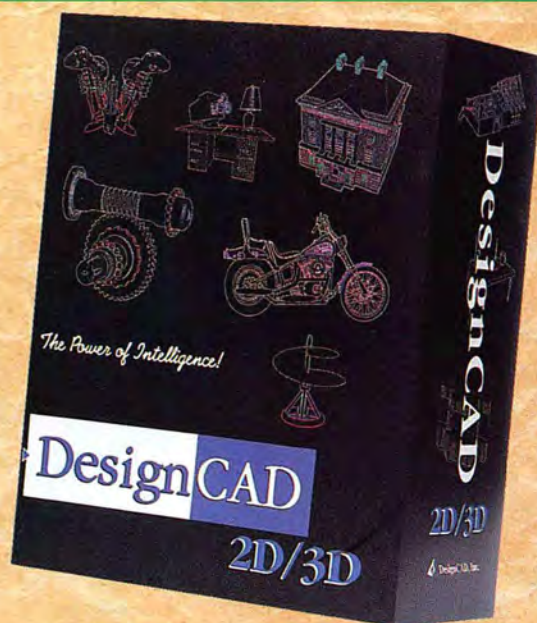
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CA-Cricket Draw III 1.1

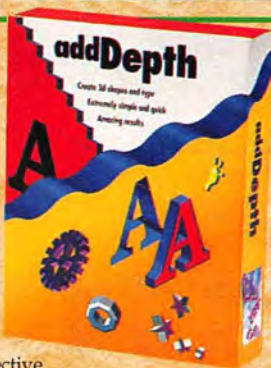
CA-Cricket Draw is a fully-featured drawing program for producing professional-quality graphics on the Mac. It features high-end drawing power with its Bezier-based tool palette, flexible color interface and more. While supplies last. Computer Associates #04414 ✓



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addDepth

Create attention-grabbing effects including type and illustrations with addDepth. It's compatible with your drawing software and it's fast and easy. Enter text or objects directly or import PostScript-compatible clip art or drawings created in drawing software such as Adobe Illustrator or Aldus FreeHand. Next, add depth and perspective automatically with addDepth's virtual trackball and perspective tool. Print from addDepth or export fully editable line art back into your Macintosh document. Ray Dream, Inc. #05965



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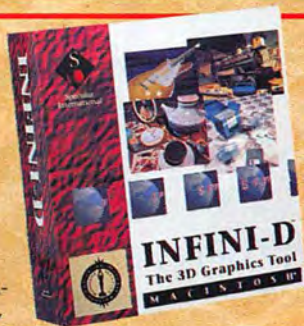
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#03582 FrameMaker 3.0\$594



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Infini-D 3D Modeler/ Animator/Renderer

Communicate and sell your ideas with stunning 3D graphics and animations—at a cost that will keep you ahead of the competition. Infini-D is a fully-integrated 3D modeling, rendering and animation package for the Macintosh which allows you to generate photo-realistic images and animations with the easy-to-use interface you've come to expect from your Mac. Specular International #00815 ✓✓



NEW

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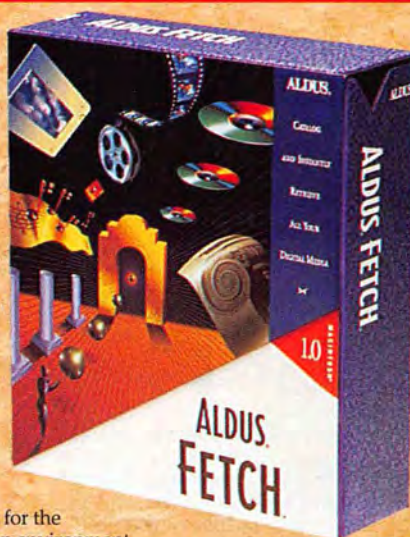
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Whether you need a file from your own hard drive or from a network that spans a corporation, Fetch makes browsing, finding and retrieving files fast, easy and efficient. Aldus #06319



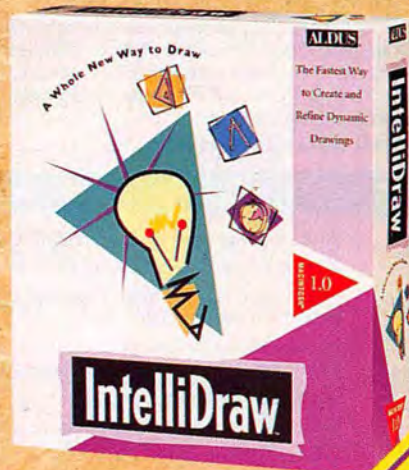
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Aldus IntelliDraw

New from Aldus, IntelliDraw is an exciting new type of drawing program that gives you an easy new way to visually experiment, refine and draw your ideas. Full text and drawing options provide the flexibility you need. Aldus #05481



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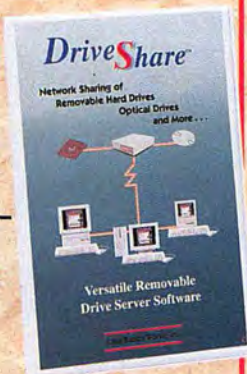
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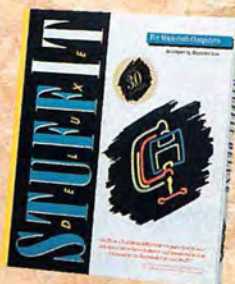
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StuffIt Deluxe is the easy-to-use Macintosh standard for transparent compression, encryption and archiving. Files can be compressed down as far as 98%, with 60% being the average. StuffIt Deluxe comes with a handy Magic Menu Finder Extension utility which makes compression as simple as clicking on any file, folder or disk icon. Compressed files can be manipulated as needed. Awarded 5 mice by MacUser magazine. Aladdin Systems #05827 ✓ ✓
★★★★★

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WriteNow Workshop Upgrade

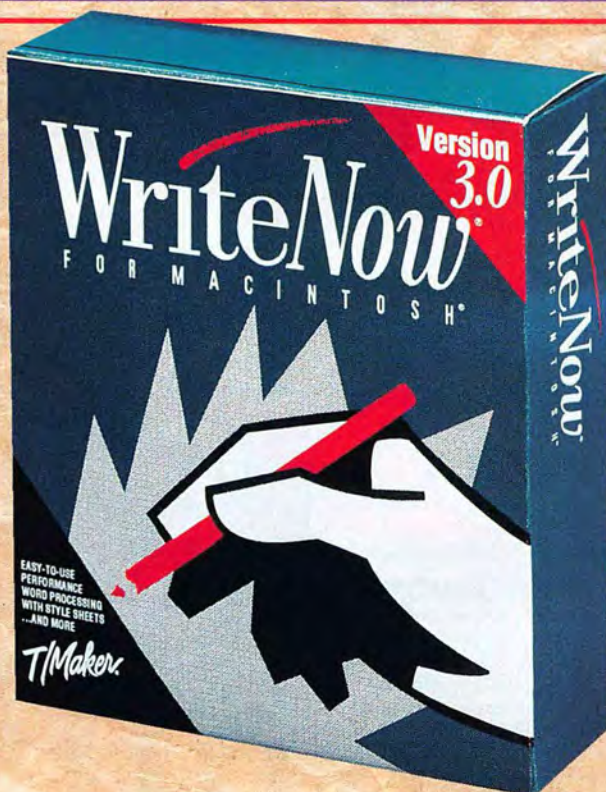
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- Highest rating for Ease of Use, Speed, Value and Documentation, Government Computer News
- Highest overall rating, Software Digest, 1990
- Editors' Choice Award, Computer Reseller News, 1990
- Editors' Choice Award, Best New Word Processor, MacUser, 1989



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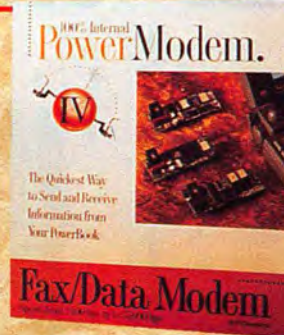
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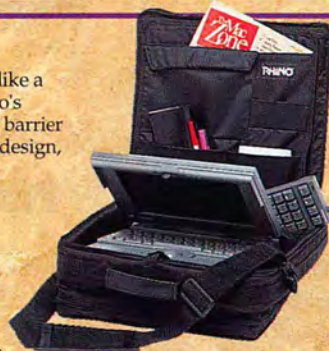
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#05909 PowerBook/Fax Case, Leather: 13.75"x2.5"x13.75" \$128

#05911 Best PowerBook Case, Leather: 15"x2.5"x10.75" \$124

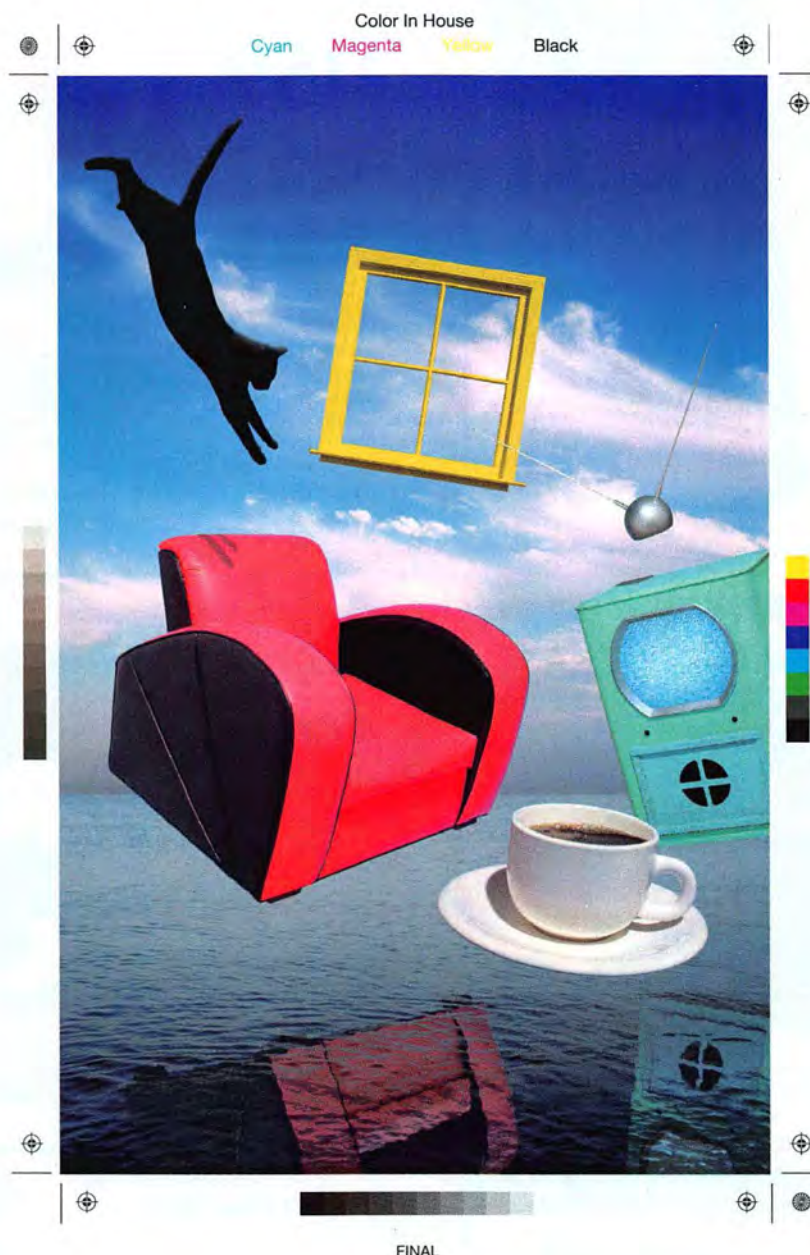


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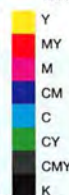
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Ears to You



Word processing.
Graphics.
Databases.
Integrated apps.
Only one of
these software
categories is really
shining at the
moment. Can you
guess which one?

Yes, it's time once again for my first annual review of software categories. You can read about products elsewhere, but only here will you find out which categories are hot, moribund, or bogus. Here and here alone, you get the skinny on the position and drift of the entire fleet, from the great vessels to the flotsam. Parents' Advisory: Although, as is customary in bullfights, I award ears (as many as two), these are virtual ears. No animals were sacrificed for this column.

After seven years, **desktop publishing** has become a mature, stable field. It has solved all of its own significant problems and, owing to the inevitable obsolescence of print, will now begin to create the paperless office. *Suuure*. Some of the more futuristic DTP watchers may be singing this tune, but you know better. Hold your ear close to the ground, and you can hear the not-so-distant rumble of whole industries toppling. DTP is still a feverishly active software category. Tasks such as imposition and color separation, until now farmed out expensively to prepress houses, are being brought to the desktop. Typography is in turmoil: Despite the existence of thousands of Type 1 fonts, Adobe Systems recently introduced a technology, multiple masters, that fundamentally redefines font generation and invites us to discard our current font libraries. Innovative means for delivering fonts (unlockable CD-ROMs) and for generating your own (Ares Software's algorithms generate common Mac fonts from a master outline) are being introduced. Even the relative stability of the feature sets of page-makeup programs is illusory; significant new features are added simply through extensions. Meanwhile, developers of groupware products are finding the highly collaborative activity of publishing to be an ideal testing ground for their technology. The paperless office? I'll believe it when I see it. Meanwhile, two ears to the very active field of publishing on paper. 🐘

Word processing is in its antimacassar phase: the same old familiar furniture dressed up with doilies on the armrests. Sound annotation, page-layout features, color text. Who needs it? No ears. 🐘

Writing tools include spelling and grammar checkers as well as electronic versions of dictionaries, thesauri, and other reference books. This category has taken a lot of abuse this past year. In these very pages, grammar

checkers were proclaimed "too dumb to be more than a nuisance" and electronic dictionaries and thesauri were dismissed as being not "half as good as my hardcover standbys." I'm among the skeptics. I've never figured out spelling checkers — doing half a job right is useful, but doing a job half-right is useless, right? But maybe I'm wrong. A lot of people seem to get something out of these products. Having my dictionary or thesaurus on my hard disk saves me — at best — five minutes a week, the way I figure it; for me, it's not worth the disk space. And using a CD-ROM dictionary would actually cost me time. On the other hand, reference books that offer deep, useful hypertext links would be wonderful, and I look forward to such products. One ear for promise. 🐘

The **graphics** category is very active, particularly in the subcategory of 3-D modeling, which would seem to be a rather narrow niche. One evidence of health in a software category is that its subcategories' definitions are fluid. We are now seeing the distinction between painting and image editing breaking down as computer images become more photo-realistic. Realistic? The boundaries between computer-generated and non-computer-generated images are getting fuzzier. Fractal Design's Painter brings a natural look and feel to its virtual media, its painting methods, and its brushes. Two ears. 🐘

Some have argued — OK, I have argued — that massive integrated-application packages are dinosaurs and ought to be supplanted by small applications that work together through system-level integration. I'm about to backpedal a bit. I won't back off from the claim that the components of **integrated applications** are weak sisters. That's obvious and probably inevitable; the components of integrated applications won't become top-of-the-line stand-alone applications, nor will integrated applications go away anytime soon. To new and impecunious users, integrated applications are a good introduction to the strong sisters, and to vendors, they are a good sales tool for getting users interested in more-featureful products. Also, vertical application areas, in particular, benefit from specialized integrated-application packages. Lawyers need lawyer word processors and lawyer billing packages and lawyer databases and so forth. Of course, lawyers can afford to buy top-of-the-line products; better substitute *scientist* for *lawyer* in the preceding.

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MICHAEL SWAINE

Still, mere unkillability doesn't earn this category any ears. 🐻

As for **PIMs**, I've never seen a personal information manager, have you? Various kinds of products get shoehorned into this pseudocategory, including electronic address books, time managers, and sales-contact managers. Programs that maintain addresses and phone numbers or that alert you when deadlines and meetings loom may deserve to be lumped together, but contact managers have more in common with — and are sometimes integrated with — order-entry, inventory, and personnel-management software. These various categories include many good products with little in common except that they "manage personal information." So does the State Department. No such category. No ears. 🐻

Compression is an active area just now, but it's really a technology rather than a software category. Often new technologies require users to do a lot of the work, but as they mature, they can become transparent features of system software or other applications. Don't count on that happening with compression. Although compression algorithms can be folded into system software; disk controllers; and graphics, sound, video, telecommunications, and network products, don't count on compression's ever becoming totally transparent. Because no one algorithm is best for all uses, some user choice is likely to continue to be required. As a technology, compression is hot stuff; as a software category, it promises to save you space but cost you time. What does it say about our values that we might even consider that a good trade-off? One reluctant ear. 🐻

OCR is still a very young category. I come to this conclusion not by counting the years it's been around but by observing its behavior. The very young have a tendency to knock things off tables and to treat everything as food. As OCR matures, we can hope it will gain coordination and discrimination. Perhaps it will learn to look at a piece of paper, separate graphics from text and blocks of letters from blocks of numbers, make reasonable guesses about unreadable letters and the fonts used, and output an electronic document that could have produced that piece of paper. That's what I want: an OCR package that can reproduce my trashed word-processing files from their printed form. We're getting some of the pieces: graphics editing, spell checking,

trainability, and the ability to specify numeric zones. One ear here, because I'm an optimist. 🐻

One handwriting expert I know is almost apologetic that he's in the less sexy recognition area. Programmers think **speech recognition** is the hot technology, so it is. But that doesn't make it a hot software category. *MacUser* contributing editor Bob LeVitus predicts that speaker-independent and in-context speech recognition will appear as a product, rather than as a technology demo, by 1994. We'll give it an ear then. 🐻

Scientific software such as Knowledge Revolution's Interactive Physics actually simulates some domain of science, opening the door to a new, more exploratory way of doing science. When you think of how many students get turned off science in high school by labs that never seem to work, it's easy to get excited about the pedagogical possibilities of this new breed of scientific software. Too bad so few kids have access to this stuff today, but one can hope. One hopeful ear. 🐻

Content-based software is inevitable. Tools are merely used, but content is consumed; the market for content regenerates without the need to design in obsolescence or dream up innovative new features. The potential market for content-based software is vastly larger than that for conventional software. And it's coming: Content is moving from clip art to photo CDs, from sound clips to songs on-disk, from little postage-stamp-sized QuickTime movies to — slightly larger QuickTime movies. One ear. 🐻


I'll summarize the rest briefly. There's a dance in the old dame yet. The following categories are managing to kick up their heels a little in their maturity: **Accounting and finance, communications, data acquisition and analysis, E-mail, and spreadsheets** all receive one ear. 🐻

Wares to watch. One ear to these young categories with possibilities: **groupware, mapping software, mobile software, multimedia, video-editing software, and visualization products.** 🐻

Antimacassar phase. No ears to these dormant categories: **data management, programming languages, and project management.** 🐻

You almost certainly know more than I do about at least one software category. If you want to give me your thoughts on some of these categories, I'm all ears. 🐻

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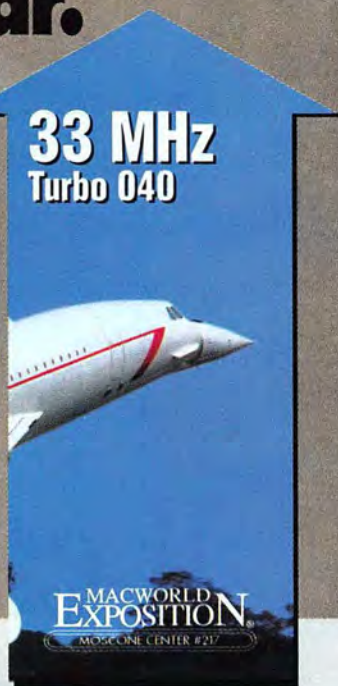
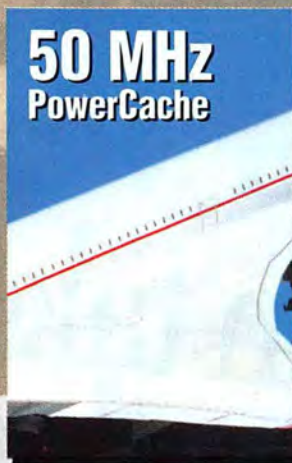
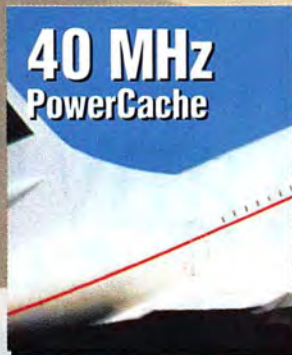
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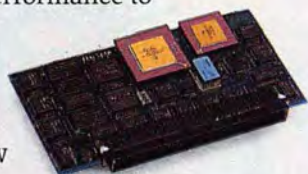
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CIRCLE 159 ON READER SERVICE CARD.



Tight squeeze: Imagine, with just a simple install, your hard disk is suddenly twice as big! Instead of compressing individual files or folders, driver-level compressors compress an entire volume. These programs trick the system's File Manager into thinking your hard disk is twice as large as it really is and then compress the data before it's written. The result is a volume that the Finder thinks of and treats as twice as big as it is. The first



two driver-level compressors you'll see on the market are derived from the same technology; the first is already shipping. ♦ **TimesTwo** (\$149), from Golden Triangle (619-279-2100), uses

compression technology licensed from Stac Electronics, the leading PC compression developer. TimesTwo replaces your hard disk's driver software, so you can't use TimesTwo on partitioned volumes. Also, because TimesTwo replaces the driver software, if you decide to go back to an uncompressed volume, you have to reformat the disk. Although TimesTwo works with removable SCSI media such as magneto-optical discs and SyQuest cartridges, those media don't auto-mount:

You must use SCSI software such as SCSI Probe to mount them on the desktop. ♦ **Stacker for Macintosh**, from Stac Electronics (619-431-7474), should be out early this year. Unlike TimesTwo, Stacker is an extension to your hard disk's driver software, so you can install and remove it without affecting your data — even on partitioned volumes. In fact, Stacker even comes with a utility for automatically decompressing the

disk. Stacker also enables you to mount Stacker-formatted removable media. Stacker should carry a list price of less than \$150. ♦ Neither TimesTwo nor Stacker try to compress already compressed files, and both automatically decompress a file when copying it to an uncompressed volume such as a floppy disk.

ARA MIA: Recent PowerBook buyers have opened their plain-brown boxes to a little surprise: no AppleTalk Remote Access! Sometime in the night, Apple decided to unbundle ARA, which it had been tossing in free with every PowerBook. Now Apple sells ARA only as a \$199 stand-alone package. All together, PowerBook owners: "Ay! I want MY ARA!"



Up to Date . . .

SAM 3.5, the latest version of Symantec's antivirus package, scans Compact Pro and StuffIt compressed files, sports a simplified interface, and uses the Apple installer. \$99. 800-441-7234 or 408-252-3570. ♦ **Lotus 1-2-3 version 1.1** is the first upgrade to Lotus' Mac spreadsheet program. New



features include Fill Down, Fill Right, and Fill Back commands; QuickTime support; and SYLK import and export. \$495. 617-577-8500. ♦ **Microsoft Office**, Microsoft's bargain bundle of its most popular applications, now includes the latest versions of those programs: Word 5.1, Excel 4.0, PowerPoint 3.0, and Mail 3.1. In effect, Office gives you four applications for less than the price of two. \$750. 206-882-8080. ☞



By Russell Ito

NEW ON THE MENU



Envisio's SmartStack SCSI devices eliminate SCSI-cable clutter. The components simply snap together like Lego blocks.



SCSI Without the Cables

Anyone who's ever added a few SCSI devices to a Mac knows that even before you start wrestling with the voodoo of SCSI termination, you have to fight your way through a jungle of dangling SCSI cables. Now, however, there's a cableless solution: Envisio's SmartStack series of SCSI devices.

The SmartStack SCSI devices — hard drives, 3.5-inch optical drives, and DAT (digital audiotape) drives — snap together like Lego blocks, without cables. All the necessary connectors are incorporated into the tops and bottoms of each unit, so all users have to do is snap them together into a tower.

The SmartStack starts with a single power-supply base unit (called the SmartSource) that provides power for as many as seven stacked devices. Turning on the power supply automatically powers up all the devices in the stack. The power supply includes a fan for the stack, which is complemented by another fan in the thin cover unit that comes with the drives to top off the stack. In addition, the base unit includes two 50-pin SCSI connectors for

attaching other SCSI devices.

Envisio also is introducing SmartStack hard drives with capacities of 120 megabytes to 1 gigabyte.

Envisio, Inc., 510 First Avenue N., Suite 303, Minneapolis, MN 55403; 612-339-1008. SmartSource, \$249; 120-megabyte hard drive, \$699; 1-gigabyte hard drive, \$2,649.

A Faster Photoshop

Experienced Photoshop users know that the program demands these three things: memory, storage, and time. Although Adobe's latest upgrade doesn't address the first two of these requirements, it is specifically designed to

deal with the third one.

Photoshop 2.5 uses a new software architecture that achieves two immediate goals: cross-platform compatibility with the Windows version and better performance, in both redraw speed and effects processing.

One of the key changes in version 2.5 is the program's new filter architecture. Because many of Photoshop's filters are calculation-intensive, Adobe has designed filter architecture to remove processing bottlenecks. These bottleneck plug-ins enable third-party developers to create special hardware accelerators that directly address the Adobe filters, rather than having to re-create them, as is currently the case.

Of course, it wouldn't be a new version if there weren't also some new tools. Version 2.5 includes dodging and burning tools that operate just like their traditional darkroom ancestors, enabling you to selectively lighten or darken portions of an image, and a new Quick Masking function, which lets you "paint" your masks for easier and faster selections.

Version 2.5's file format allows you to open Kodak Photo CD images as well as open and save JPEG (Joint Photographic Experts Group) files.

Adobe Systems, Inc., 1585

Charleston Road, P.O. Box 7900, Mountain View, CA 94039; 415-961-4400. \$895.

Kodak Color Management

The more you use color, the more frustrated you can get. Why is the red so orange? and Why are my blues so purple? are typical cries of anguish. Effective color-management systems designed to give you the same color from your scanner, display, and printer have been prohibitively expensive, but Kodak is about to change all that.

Kodak's ColorSense package is the first color-management system designed with average users in mind. For an expected street price of around \$350, ColorSense includes everything you need to keep your color devices in line: a color calibrator; a scanner target; and software, including management software and device profiles for at least 16 printers, 11 scanners, and 10 monitors. ColorSense should be especially attractive to those who plan to incorporate Kodak's Photo CD-format images into their documents, because it ensures that the colors in printed images match those of the original photos.

Eastman Kodak Co., 343 State Street, Rochester, NY 14650; 800-242-2424, ext. 53. \$495.

Photoshop 2.5 is built for speed. The program's new architecture produces faster screen redraws and allows for faster plug-in tools. New dodging and burning tools let you selectively lighten or darken parts of an image.





Kodak's ColorSense package makes sense of color for average users. ColorSense includes everything you need to get accurate color — at a street price of about \$350.

SuperATM: Super Font Swapper

The cornucopia of fonts available to Mac users has made their documents really stand out — as long as everyone has the necessary fonts. But if you pass a document to someone who doesn't have the same fonts, forget it. Your beautiful document often appears with disappointing Courier or Geneva in place of the fonts you used. As a result, all of your line and page breaks — indeed, the entire page design — is destroyed. What you need is effective font substitution, and that's what Adobe's SuperATM offers.

SuperATM, which supplements but does not replace the current ATM, comes with two new multiple master fonts called serif and sans serif and a special version of Adobe Type Reunion. When you install SuperATM, you also install a font-metrics database that includes specifications for the width and weight of 1,300 Adobe fonts. Then, every time you open a document containing fonts that aren't installed in your Mac, SuperATM kicks in and uses the metrics database to create substitute fonts from the multiple master fonts that preserve the look and spacing of your originals.


These substitute fonts can be used and reused just like any installed font, so you can edit the document as you normally would. When you print the document, SuperATM prints the substituted fonts — unless the actual fonts are installed in either the printer or the computer from which the document is printed, in which case SuperATM prints the actual fonts. To indicate substitute fonts on your font menu, Type Reunion places a black diamond beside the font name.

Not every application is SuperATM-savvy, but most of the leading programs are (or soon will be). Among the savvy packages are Excel 3.0 and 4.0, Word 4.0 and 5.0, FreeHand 3.1, PageMaker 4.2, ClarisWorks 1.0, FileMaker Pro 1.0, MacDraw Pro 1.5, MacProject Pro, Publish It! 2.1 and Publish It! Easy 1.0, and QuarkXPress 3.1.

Even if your application doesn't allow automatic font

substitution, you can still take advantage of SuperATM by using manual substitution: The SuperATM package includes Adobe's Type On Call CD-ROM, with the bit maps of 1,300 fonts unlocked. Just install a bit map for a font,

and SuperATM makes the appropriate substitution. And again, the actual font will display or print if it's installed.

Adobe Systems, Inc., 1585 Charleston Road, Mountain View, CA 94039; 415-961-4400. \$149. 

Adobe's SuperATM makes intelligent font substitution possible. If you don't have a font installed, SuperATM will automatically build a substitute font (top) that's almost as good as the original (bottom).

TRAVEL TRAVEL

NewsLine

Reports and Analysis

Apple Changes PowerBook 180 Prices

CUPERTINO, CA — Just as we were releasing our December issue, Apple changed its prices for the PowerBook 180. At the last minute, Apple boosted the prices for both the 4/80 and 4/120 configurations of the PowerBook 180 by \$240 (about 6 percent). The corrected list prices are \$4,109 for the 4/80 and \$4,469 for the 4/120.

Apple Unit Sales to Top IBM's

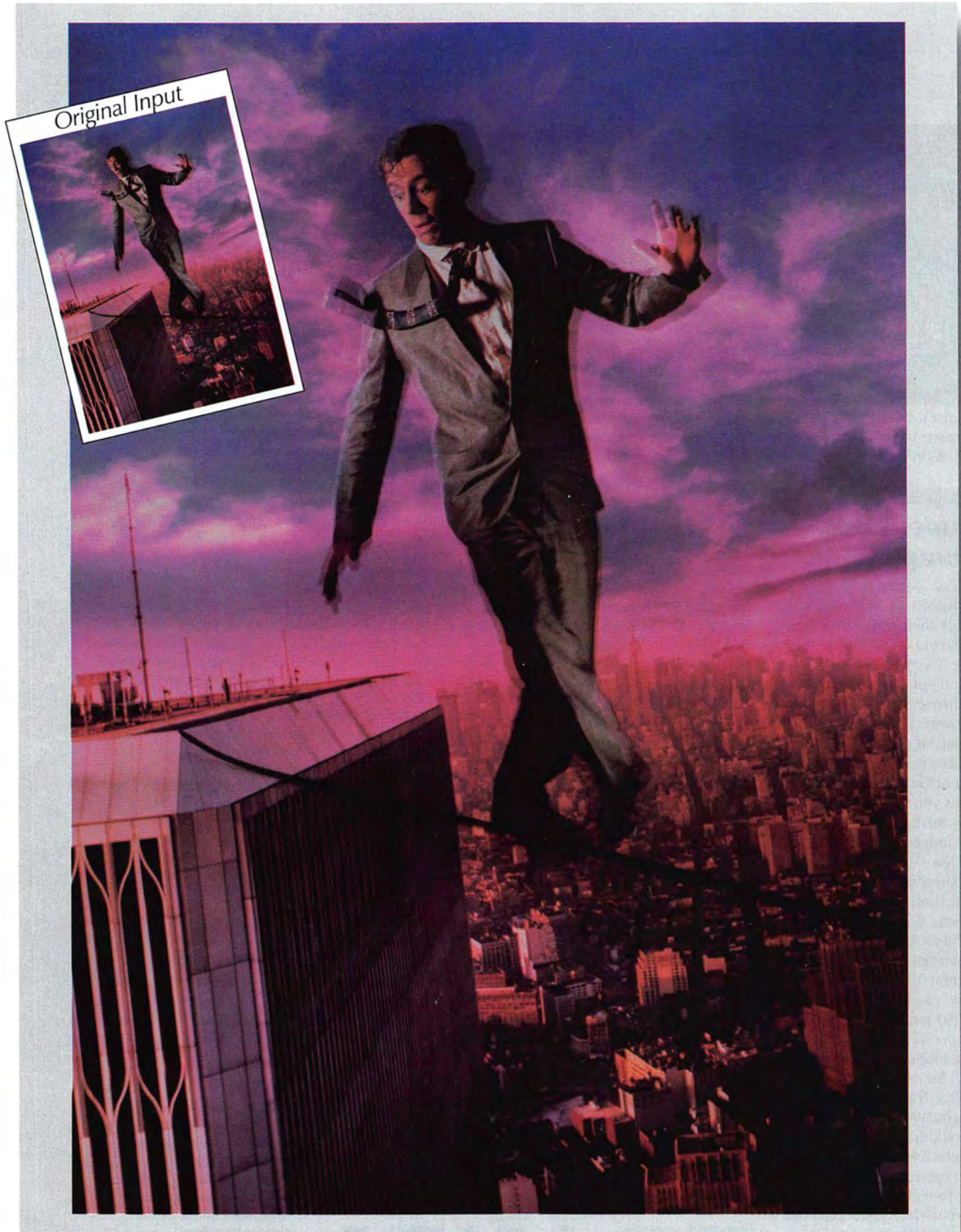
CUPERTINO, CA — Based on a leading industry research firm's projections, Apple will have shipped more personal computers than IBM in 1992. This marks the first time Apple has beaten IBM in unit sales, and analysts say it reflects the shift in the market from large mainframe units, IBM's mainstay, toward desktop personal computers. In 1990 Apple shipped 1.69 million units, to IBM's 2.84; by 1991 the gap had narrowed to 2.48 for Apple and 2.91 for IBM. When 1992's figures are tallied, Apple will have sold 3 million units to IBM's 2.9 million.

System 7.1 Pricing

CUPERTINO, CA — If you read our story in the December issue about Apple's newest version of System 7 (version 7.1), you may have noticed a small omission: the price for the package. Apple has finally settled on some prices: The Personal Upgrade Kit will list for \$99; the System 7 Multi-Pack will list for \$499.

QuickTime for Windows

CUPERTINO, CA — Apple has announced the completion of a QuickTime player and a QuickTime development kit for Windows. The Windows QuickTime products will let developers integrate QuickTime playback and control into their Windows applications. Apple also announced that it is integrating Intel's Indeo video-compression technology into QuickTime. With Indeo software and hardware from third-party manufacturers, users will see faster QuickTime playback speeds and larger — up to full-screen — images.



The Kodak ColorSense Color Manager helps you match printer output to the original image.

WHEN COLOR CONSISTENCY HANGS IN THE BALANCE.

Introducing the Kodak ColorSense Color Manager. For true color balance across your entire Macintosh Computer System, in one complete and affordable solution.

To get the colors you want out of your color desktop peripherals, you want the Kodak ColorSense Color Manager.

It's a software tool that balances your color desktop peripherals so they all speak the same color language. It's also a hardware tool that calibrates your monitor for consistent screen display over time.

The result? Balanced, accurate color from start to finish. What you see is what you get. No more guesswork. No more surprises. So now, when you want to present or sell a graphic idea, you'll have the color you want. Instead of a poor excuse.

You'll also generate fewer reprints as you work. Saving you time, material, and wear and tear on the printer.



Thanks to an easy-to-use interface, the ColorSense Color Manager is a cinch to set up and use. Just select the devices (scanners, Photo CD disc, monitors, printers) and the ColorSense Color Manager does the rest.

Call 1 800 242-2424, Ext 56, today for an information kit on the Kodak ColorSense Color Manager. And experience accurate color like never before.

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COLORSENSE
C O L O R M A N A G E R



Even visionaries need to see reality



CIRCLE 171 ON READER SERVICE CARD.

PRESENTATIONS

Microsoft PowerPoint 3.0

*The long-awaited PowerPoint upgrade boasts a WYSIWYG
outliner and near-seamless Mac-to-PC file exchange.*

If you long ago gave up on a major upgrade to Microsoft's presentation-software package, take heart — PowerPoint 3.0 has finally hit the streets with a slew of new features that make it well worth the long wait. Not since the spring of 1988, when George Bush was mounting his first run for the presidency and Apple's first Mac Portable hit the streets, have we seen a new release of PowerPoint. Now, nearly five years later, Apple's sleek PowerBooks have replaced the clunky Portable, President Bush has come and gone, and Microsoft has delivered an impressive new PowerPoint that clearly outclasses the competition.

Ground-Breakers

PowerPoint 3.0 has not only been successful at playing catch-up with its archrival, Aldus Persuasion, but it also surpasses Persuasion in several key areas. Catch-up features include a new Outline view, the ability to alter master slides at any point during the presentation-creation process, a run-time player, System 7 goodies, and cross-platform compatibility with PowerPoint for Windows. Several other enhancements break new ground in the presentation-software category. They include a versatile shape tool, built-in charting capabilities, the ability to embed objects, and a handy tool bar similar to those used in other Microsoft applications.



Microsoft PowerPoint
Published by: Microsoft Corp.,
One Microsoft Way, Redmond,
WA 98052; 800-426-9400 or
206-882-8080.
Version: 3.0.
List Price: \$495.

Although PowerPoint 3.0 represents a sweeping upgrade, the program retains the same general look and feel as its predecessor. To create presentations, you work within four views — Outline, Notes, Slide, and Slide Sorter. PowerPoint provides a context-sensitive tool bar in each of these views. The tool bar's buttons provide handy access to commonly used functions, such as text formatting and outline reorganization.

The new Outline view lets you enter or import the text for your presentations. Although Persuasion has included an outliner for years, PowerPoint ups the ante by making its outliner WYSIWYG (what you see is what you get). Unlike Persuasion's outliner, PowerPoint's lets you format text and view the changes you make, which makes it easier to visualize slides and eliminates the need for continually switching back and forth between the Outline and Slide views. PowerPoint lets you open existing outlines created with word-processing

applications and saved in RTF, plain-text, or Microsoft Word format. The program automatically creates a presentation from the outline, with each major heading becoming a slide.

An even more significant difference between PowerPoint and Persuasion is the way in which each program handles master slides. With either program, each master-slide element appears on every slide in a presentation. You can then alter individual slides as you wish. PowerPoint, however, allows only a single master slide for each presentation, whereas Persuasion lets you create several master slides.

Although PowerPoint's approach leaves no room for confusion, some users may find it limiting. If, for example, you're working on a 40-slide presentation and 20 slides are to display bullet points, 10 are to display charts, and 10 are to display titles, PowerPoint's approach isn't as convenient as Persuasion's. With PowerPoint, you set up a single, bulleted-text master slide, which lets you produce half of your presentation quickly; for the other half, unfortunately, you must hand-adjust all the slides.

By contrast, because Persuasion lets you create several master slides, you can have a different master for each type of slide. If you frequently produce slide presentations that require many distinctly different slide types, you may be better off with Persuasion.

Master slides, color schemes, and note and handout masters combine to form templates. With version 3.0, PowerPoint's template handling is significantly improved. Earlier versions forced you to select a template *before* you created your slides; version 3.0 lets you apply a template whenever you want. Template changes affect every slide in the presentation, although elements you've customized, such as italicized text, remain untouched.

The PowerPoint package comes with 160 predesigned templates for 35mm



The PowerPoint 3.0 program is a sweeping upgrade of Microsoft's presentation-software package. The new release features several major enhancements, including a handy tool bar (top) and a versatile shape tool, which is really 24 drawing tools in 1.

slides, overheads, and on-screen presentations. Because templates use the same file format as presentations do, you can use any presentation as a template without having to jump through conversion hoops.

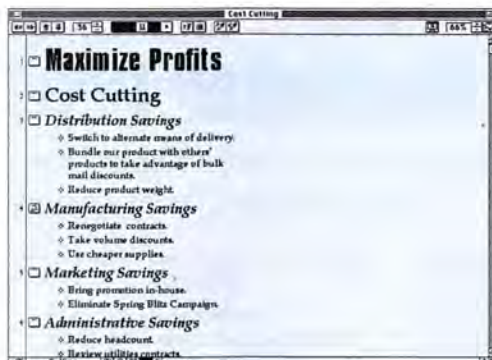
Microsoft Graph

PowerPoint 3.0 is the only presentation-software package that includes a full-fledged charting program, Microsoft Graph. DeltaPoint took the opposite route with DeltaGraph Professional by focusing on sophisticated charting software and adding a presentation slide-show module later, although charting remains DeltaGraph Pro's primary function. PowerPoint's Microsoft Graph is a built-in application that is also included with Microsoft Excel and Microsoft Word. To launch Graph, you click on PowerPoint's graph tool or double-click on an existing chart. Graph offers 84 styles of 2-D and 3-D charts, including area, bar, line, column, pie, scatter, and combination charts. Charts automatically take on the color scheme of the presentation they enhance, and chart colors are updated when you switch templates.

The ability to launch Microsoft Graph from within PowerPoint is an example of Microsoft's OLE (Object Linking and Embedding) technology, perhaps more familiar to Microsoft Windows users than to Mac users. OLE makes it possible to launch other applications from within PowerPoint as well, although Microsoft Graph is the only program that's built in and directly accessible from PowerPoint's tool palette. You can launch Microsoft Excel from within PowerPoint by using menu commands, for example, and you can embed worksheets in PowerPoint slides. When you double-click on a worksheet, Excel launches and you can edit the worksheet.

PowerPoint provides the standard selection of drawing tools plus one unusual standout. The new shape tool, which lets you click and drag to create 24 different shapes — including star bursts, arrows, triangles, and diamonds — is a decided boon for nonartists.

In addition, PowerPoint imports graphics (PICT, EPS, MacPaint, TIFF) and QuickTime movies to help you jazz up your slides. Oddly, to import these elements, you use the Insert command, on the Edit menu, rather than the Import command, on the File menu, which is



PowerPoint's new Outline view is WYSIWYG, so you can format text as you would like it to appear in your presentation and view the results without having to switch to Slide view.

A new built-in charting application called Microsoft Graph lets you create a variety of 2-D and 3-D chart types from within PowerPoint. Graph lets you customize the look of 3-D charts by altering perspective, rotation, and elevation.

more intuitive. You can also bring in artwork by using System 7's publish-and-subscribe. To help you make your points more forcefully, PowerPoint also includes a new John Madden feature, which lets you mark your slides as you give your presentation.

You can play your presentations on a Mac equipped with either the PowerPoint application or Macintosh Viewer, a player that's included with the package and that you can distribute freely. You can also play presentations created with a Mac on a Windows machine that's running PowerPoint's PC Viewer. PC Viewer is not included with the Mac package, however (contact Microsoft for a free copy).

A big plus for mixed computing environments is the ease with which you can exchange entire presentations and templates among Macs and PCs. With few exceptions (QuickTime movies are most notable), we were able to open and edit all the elements of a Macintosh presentation with PowerPoint for Windows, and vice versa. Even PowerPoint's fancy new transitions, which include Horizontal and Vertical Blinds, Checkerboards, and Strips, transferred flawlessly to a PC. For optimal cross-platform type

exchange, we recommend the use of TrueType fonts.

PowerPoint 3.0 requires System 7 and at least 4 megabytes of RAM. You'll need additional RAM if you plan to use OLE to launch other applications from within PowerPoint. A full installation of PowerPoint, including samples, templates, and clip art, requires nearly 14 megabytes of disk space.

Overall, we were impressed with PowerPoint's well-thought-out new features, but there are still a few items on our wish list. We'd like to see a text-alignment button in the tool bar as well as a kerning tool. It would also be handier to access the cropping tool from the tool palette rather than from the Object menu.

The Bottom Line

PowerPoint 3.0 represents a major overhaul of Microsoft's presentation-software package. Most noteworthy are the addition of a WYSIWYG outliner and a superb level of compatibility between the Mac and Windows versions. In short, the new release goes beyond closing the gap between PowerPoint and its chief rival, Persuasion; with version 3.0, PowerPoint has clearly taken the lead.

— Shelley Cryan

DATABASE MANAGEMENT

FileMaker Pro 2.0

FileMaker Pro's new script-writing tool lets nonprogrammers build professional database applications.

Although you can find more-sophisticated database programs than Claris' FileMaker Pro, none offers FileMaker Pro's special mix of accessibility, usability, and power. With the latest release of its best-selling flat-file-database program for the Mac, Claris has made it even easier for nonprogrammers to roll their own database applications, by dramatically improving FileMaker Pro's scripting. Moreover, with the recent debut of FileMaker Pro for Windows, cross-platform environments gain the first database program that works the same way on PCs and Macs and that also shares files nearly transparently over mixed networks. FileMaker Pro 2.0 is, quite simply, the most powerful do-it-yourself database-development tool for small businesses and workgroups.

Do-It-Yourself Scripting

FileMaker Pro 2.0 introduces ScriptMaker, a powerful script-writing tool that lets users who have no programming experience automate virtually every FileMaker Pro operation, including every command in the menu bar. You can create scripts in any of FileMaker's modes — Browse, Find, Layout, and Preview — simply by making selections from a comprehensive scrolling list of commands. Surprisingly, however,

FileMaker Pro

Published by: Claris Corp., 5201
Patrick Henry Drive, Santa Clara,
CA 95052; (408) 727-8227.

Version: 2.0.

List Price: \$399.

ScriptMaker lacks a "watch me" facility for recording a series of operations and automatically compiling them into a script.

FileMaker Pro scripts look like miniprograms, although they don't include multidimensional variables; conditional statements, such as WHILE/THEN and IF/THEN; or looping statements, such as REPEAT UNTIL and DO 500. To give users a leg up on the script-writing process, the program provides a good selection of sample scripts, including the following:

```
Enter Browse Mode [ ]
Go to Layout ["Layout #"]
Page Setup [Restore, No dialog]
Find All
Print [ ]
```

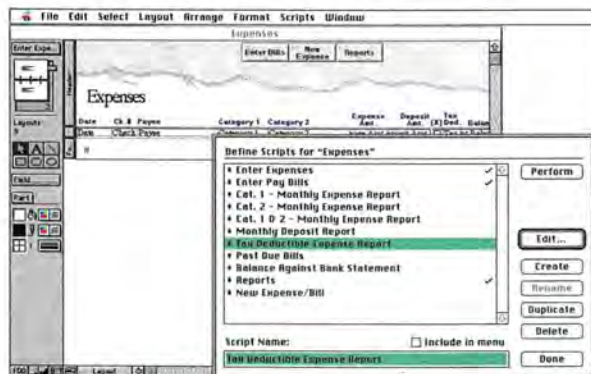
When this script runs, FileMaker Pro enters Browse mode, searches for records, and then shifts to the specified database layout. The program then prepares a page for printing and restores the

original page setups without interrupting the script with the Print Setup dialog box. Last, the script finds all the records in the database and prints them.

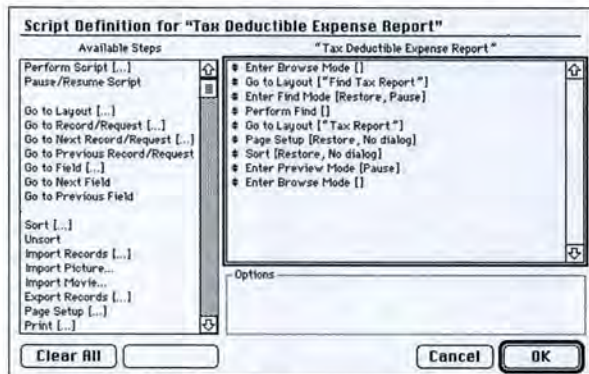
Apple-Event Support

This sample script only scratches the surface of ScriptMaker's abilities, which go far beyond automating simple tasks. ScriptMaker lets you perform external scripts in other files from within a script as well as create and perform nested subscripts. In addition, FileMaker Pro 2.0's System 7 support lets ScriptMaker use Apple events to control other Apple-event-aware applications as well as publish records and database files for use in other applications.

One of the slickest applications we've seen that combines ScriptMaker and Apple events is documented in Rich Coulombre and Jonathan Price's new book, *FileMaker Pro 2.0 on the Macintosh* (Addison-Wesley: Reading, Massachusetts, 1993). In this application, users are able to graph a set of FileMaker Pro records and fields simply by clicking on a button. Clicking on the button runs a complex script that causes an Apple event to launch Excel 4.0, which graphs the results on-screen. In short, ScriptMaker empowers nonprogrammers to create nearly stand-alone FileMaker



FileMaker Pro 2.0 retains the database program's ease of use and good-looking layouts while adding powerful scripting capabilities. The Define Scripts dialog box (left) lists existing



scripts. To define a new script, you click on the Create command and then make selections from the list of commands in the Script Definition dialog box (right).

Pro applications that resemble those developed with more-sophisticated relational-database programs.

Templates

In addition to more-powerful scripting abilities, the new version of FileMaker Pro includes numerous clever features that help users work more efficiently. The package provides a good selection of templates for performing common business functions such as creating invoices and mailing lists and tracking leads. An improved layout generator, which includes layouts for more than 50 Avery labels (such as the famous Avery 4605 two-up label) eases the tedious task of printing labels.

Clarix has also enhanced FileMaker Pro's text handling. Version 2.0 supports superscripts and subscripts, small caps, strikethroughs, and more. In addition, with its newly added QuickTime and sound support, FileMaker Pro lets you incorporate movies and sound with your layouts.

Version 2.0 features enhanced file-exchange capabilities. It can import and export files in WKS, DBF, DIF, and SYLK formats as well as in the previous version's comma- and tab-delimited formats. To enhance its cross-platform strategy, the new version also supports PC graphic file formats.

The first version of FileMaker Pro provided a modest Find feature that could search for single strings quickly. Version 2.0 adds single-character and multiple-character wildcard searches; context searches; Boolean-combination searches; and a variety of more complex search operations, such as the ability to find a value within a chronological range in a date or time field, which is typically associated with high-end relational-database programs.

Easy to Use

Despite the addition of these powerful new features, FileMaker Pro retains its ease of use. The program's superb built-in help system uses a HyperCard implementation that functions as both an online reference and a tutorial. The new version employs the same well-designed interface as its predecessor did for creating forms, performing data entry, searching for values, and previewing printed reports. To move among these modes, you can choose to use either pull-down



The FileMaker Pro 2.0 package includes a variety of templates, such as the one shown here, for handling common business tasks, as well as layouts for 50 different Avery labels.

menu commands or buttons.

FileMaker Pro's object-based, graphical form-design engine made the program popular among nonprogrammers from the start. FileMaker Pro fields are easy to work with and can be of nearly any type, including text, number, date, time, picture, sound, movie, calculation, and summary. The program provides full search and sort capabilities for all field types, with the exception of picture, sound, and movie (good search algorithms for these field types have yet to be implemented by any vendor).

Other interface strengths include the incorporation of buttons in applications. You can use buttons to invoke scripts or to issue menu commands. The program also boasts a flexible data-entry-and-report generator that provides full control over font, size, style, color, and line spacing. Moreover, you can place graphics, such as company logos, in reports or save them in a database as data elements.

FileMaker Pro's multiuser features let workgroups on a network add, edit, delete, and report on records stored in a single database file without the need for file-sharing software. Instant file updating ensures that users are always working with the most-current data, and record locking prevents more than one user from modifying the same record at the same time.

FileMaker Pro for Windows

FileMaker Pro was developed from the ground up as a Macintosh application. Clarix has, however, done a stellar job of developing the Windows version of this popular database program, which was released shortly after version 2.0 for the Mac.

FileMaker Pro for Windows is virtually identical to its Mac sibling. Each program uses the same file format and can share data files, scripts, graphics, layouts, and full-blown scripted applications over mixed Mac and PC networks (not all file types can be exchanged among platforms, because some Mac data types simply don't exist in Windows, and vice versa). In addition, Mac and PC clients can access the same FileMaker Pro file, whether it resides on a Mac server or a PC server, making the program's cross-platform operation nearly transparent and surprisingly fast.

The Bottom Line

With version 2.0 of FileMaker Pro, Clarix has done a superb job of boosting the database program's feature set and power without sacrificing ease of use and accessibility. The most important new feature by far is ScriptMaker, which gives nonprogrammers unprecedented point-and-click control for creating sophisticated scripts and near-stand-alone applications that rival those crafted with code-based database-development tools. And with the recent introduction of the equally well-designed FileMaker Pro for Windows, Clarix offers the added advantage of transparent cross-platform interoperability for mixed Mac-and-PC networks.

If you don't require the special talents of a sophisticated relational-database program and you're looking to avoid the cost of hiring outside consultants to do your database development, you'll have no trouble building your own professional-looking system with FileMaker Pro 2.0.

— Don Crabbe

UTILITIES

Now Utilities 4.0

Now Software's System 7 utilities package takes productivity enhancement to new heights.

If you're already a user of Now Software's blockbuster System 7 utilities package, you know that once you've lived with Now Utilities, you never want to live without them. With version 4.0, Now Software has significantly beefed up the package's already powerful file- and system-management capabilities and added a turbocharged replacement for the Mac's Scrapbook.

The Now Utilities 4.0 package includes seven utilities in all. NowMenus and Super Boomerang are the superstars of the collection. NowMenus creates a hierarchical Apple menu that can support as many as five levels of submenus, giving you instant access to all items stored in Apple-menu folders. It also creates two pull-down launch menus that give you access to active and recently opened applications as well as recently opened documents. Not only can you custom-configure the launch menus but you can also create as many as 17 additional pop-up launch menus that you can call up from the keyboard by holding down the mouse button.

NowMenus also lets you quickly and easily add keyboard command equivalents that open any menu item, whether it resides on the Apple menu, the custom launch menus, or the menus of any application. Furthermore, you can select your own fonts for any menu and add separator lines that let you visually group Apple- and launch-menu items.

Super Boomerang enhances the Open and Save As directory dialog boxes in much the same way as NowMenus enhances menus. When you choose either command, Super Boomerang displays its special directory dialog box, which includes a menu bar that lets you move directly to any file or folder anywhere on your disk as well as choose from a list of recently opened files and folders.

To every application's Open command, Super Boomerang also attaches a DirectOpen submenu, which provides access to recently opened files and folders. In addition, a powerful Super



Now Utilities

Published by: Now Software, 319 S.W. Washington Street, 11th Floor, Portland, OR 97204;
503-274-2800.
Version: 4.0.
List Price: \$149.

Boomerang Find command on the submenu lets you search for files by filename or by text contained within the file. The most recent Super Boomerang version even works with files compressed with Compact Pro, AutoDoubler, SuperDisk, or MoreDiskSpace.

The other utilities in the Now collection are equally powerful, although their appeal may be more limited. Now Scrapbook lets you organize PICT, paint, TIFF, EPS, text, sound, and QuickTime files into catalogs. It also gives you thumbnail previews of your files. With the Clipboard editor, you can resize portions of graphics and assign keywords to items so you can locate them quickly.

WYSIWYG Menus, in addition to displaying fonts in their actual typeface on menu lists, creates submenus for typefaces for which you have more than one

style installed. You can organize your font menus by assigning custom colors to font names and by reordering fonts so that your favorites appear at the top of the menu.

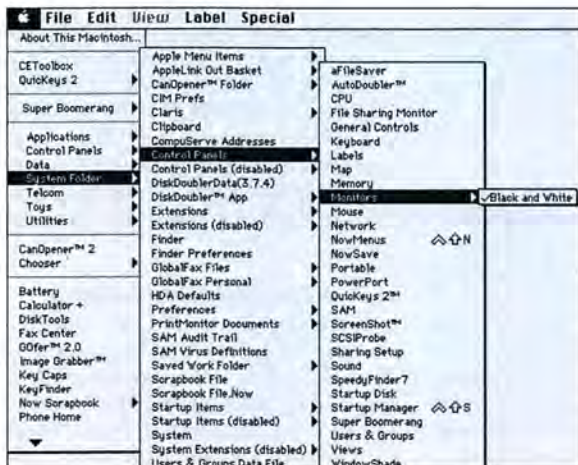
NowSave is a control panel that automatically saves your work after a specified time interval or after a certain number of keystrokes or mouse clicks. The Now Profile utility provides reports on your hardware specifications and configurations as well as detailed information on your fonts, printer drivers, control panels, extensions, DAs, and duplicate files. Finally, Startup Manager controls the loading of extensions, control panels, and even the entries in your Startup Items folder.

Now Utilities 4.0 is one of the best productivity enhancers you can find, but the initial release was plagued by several bugs. Fortunately, Now Software has corrected these problems in an update (4.0.1) that will be available by press time.

The Bottom Line

Now Utilities is a must-have for any serious System 7 user. Even if you find that several items in the collection don't suit your needs, those that do will be well worth the cost of the package.

— Bob LeVitus



The most recent version of Now Utilities features even more handy features than its predecessor did. The NowMenus utility, shown here, is probably the most useful system enhancement available. It provides a hierarchical Apple menu you can customize to your heart's content.

InTouch 2.0

Advanced Software's newly overhauled address-book manager offers speed and versatility.

With the latest version of its veteran address-book manager, Advanced Software has clearly groomed InTouch for today's highly competitive PowerBook-driven PIM (personal-information manager) arena. Combining an address book, contact log, appointment calendar, and to-do list in a single DA, InTouch 2.0 also boasts an innovative control-panel feature that no other PIM program offers.

InTouch uses a notecard metaphor — you enter address information on one portion of the card and notes on the other. The notes window is resizable up to full-screen size and can accommodate 32,767 characters per record.

Because its design is free-form, InTouch doesn't force you to enter information into prestructured fields: You type directly into a notecard. This approach is fast and flexible, but it has its limitations. You can't, for example, perform complex searches within fields. Nonetheless, with this new version, Advanced Software has partially circumvented the limitations of its free-form design.

Version 2.0 not only lets you group records according to different criteria but also lets you view a group of records, or the entire database file, in the program's new list view. This addresses a major drawback of the previous version, which could display only one record at a time. You can also mark records and designate them for special tasks.

InTouch's search and sort speeds are vastly improved in the new version. Search options let you perform searches on the entire database or on individual groups. You can assign search results to temporary groups, add them to existing groups, or replace existing groups with newly found records. To search for an individual record, you simply type a text string into the program's Search bar. Unfortunately, the program doesn't provide a direct way to duplicate records.

A long-standing InTouch strength has been its full-featured envelope- and label-printing capabilities. The program



InTouch
Published by: Advanced
 Software, Inc., 1095 E. Duane
 Avenue, Suite 103, Sunnyvale, CA
 94086; 408-733-0745.
Version: 2.0.
List Price: \$99.95.

provides a straightforward way to design and print envelopes, labels, address books, and fax cover sheets. The package includes several popular formats, including #9 and #10 envelopes, a handful of Avery labels, and DayRunner pages. These forms are fully customizable and support PICT graphics and bar codes.

InTouch 2.0's reminder feature is a welcome newcomer to the program. You can create various reminder types, such as advance notices, and define them as date or block of time, which enables you to separate scheduled events from to-do items. The program lets you set repeating reminders, and you can view your reminder lists in a variety of ways, including by day, week, or month.

The program provides a simple calendar, but its scheduling features aren't designed to compete with those of full-blown calendar programs such as Now Up-to-Date and DateBook.

InTouch's most innovative feature is its Snap* control panel, which makes it

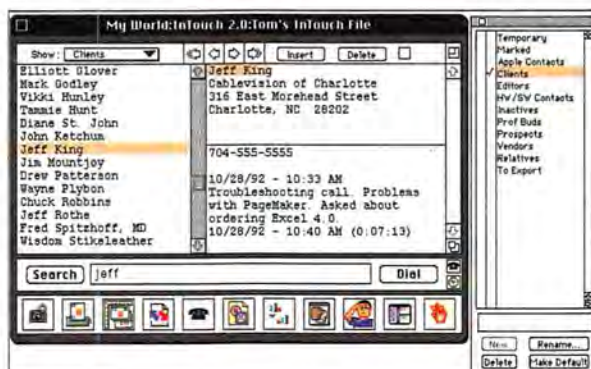
easy to access InTouch address information from within other applications. For example, from within your word processor, you can highlight a name in a letter and press a hot key, and Snap* will fetch the matching address from the InTouch database file, paste it into your letter, and even print an envelope. Similarly, you can highlight a phone number from within another application and invoke the hot key, and Snap* will access the database and auto-dial the number.

The InTouch DA, Snap* control panel, and Preference files require less than 80K of RAM and 475K of disk space. That doesn't include the size of your individual data files, but they're designed to be compact. A medium-sized file of 200 records, for example, occupies less than 45K. The data file loads into RAM, so its diminutive size is a plus.

The Bottom Line

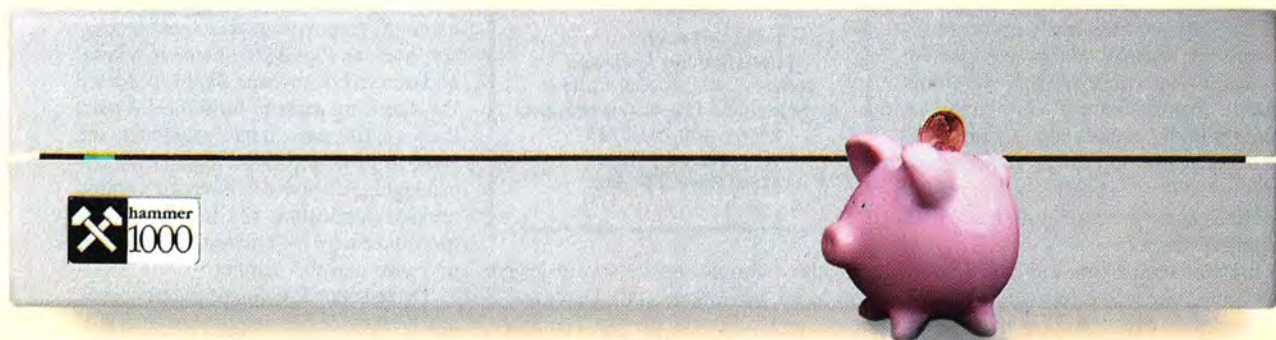
InTouch's performance is considerably improved, and new group-search options combined with a list view overcome the previous version's inability to display more than one record at a time. To-do lists and reminder features are both welcome additions. The program's slim, trim size makes it a good fit with PowerBooks and Duos. If you don't require the bells and whistles of structured-database PIMs, InTouch 2.0 may be just the ticket for managing your contacts.

— Tom Petaccia



New reminder features, improved performance, and a handy list view for viewing groups of records enhance InTouch's position in the exploding PIM arena.

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MODELING

MacroModel 1.0

Swivel 3D's successor achieves new heights in 3-D-modeling precision and interface design.

In the beginning there was Swivel 3D Professional, and it was good. Now there's MacroModel, and it's even better. Traditionally, advancements in Mac-based 3-D modeling have involved constant compromise — each increase in power adversely affected software complexity and performance. MacroMedia's MacroModel, the latest professional 3-D-modeling tool from the maker of Swivel 3D, aims to boost modeling power without taking a toll on performance and ease of use. The program teams spline-based modeling tools with an innovative interface and precise numerical accuracy, making it an excellent choice for prototype design.

Model Program

As a full-featured spline-based modeler, MacroModel will feel familiar to anyone who has worked with traditional illustration, drawing, or CAD software. The program distinguishes itself from its older sibling, Swivel 3D, by offering precise numerical control over object data. A single window serves for viewing as well as editing models.

To build objects in MacroModel, you begin by defining 2-D shapes, using familiar 2-D-drawing tools (lines, ovals, rectangles, and polygons). The program provides a variety of options for editing the 2-D outlines, including a fillet tool for creating smooth edges and tools for cutting and joining segments of outlines.

You can then further process the 2-D outlines with MacroModel's extrusion, lathing, sweeping, and lofting functions to create complex 3-D objects. A strip of real estate along the bottom of the screen displays a brief description of any tool or menu item currently under the cursor — a welcome guide that you can turn off once you're familiar with the program.

All tools work within a plane that you can rotate and adjust — an approach taken by other high-end modelers such as Alias Sketch. You can extrude any outline along any path, effortlessly creating spiraled springs, bent and winding



MacroModel

Published by: MacroMedia,
600 Townsend Street, Suite 301,
San Francisco, CA 94103;
415-442-0200.

Version: 1.0.

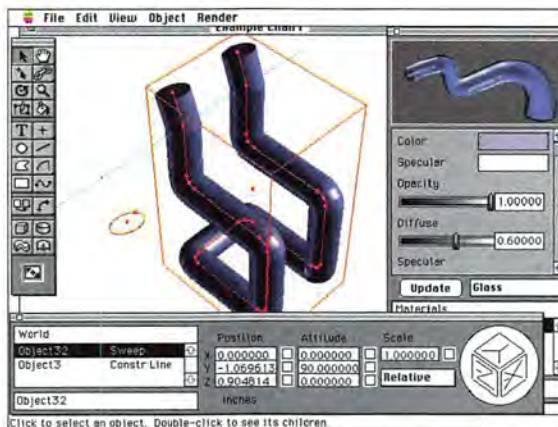
List price: \$1,495.

tubing, and other unusual shapes. In addition, you can create smooth, detailed 3-D type effects by extruding TrueType and PostScript fonts, using a variety of options.

Once you've created an object, you can reshape it in a variety of ways. You

can edit the 2-D outlines that comprise it or manipulate it at the vertex level, which is the closest you can come to gaining absolute control over objects in a 3-D-modeling program. You can also add vertices to any part of an existing surface as well as select discontinuous sets of vertices for object reshaping.

MacroModel gives you the same precise control over the curve characteristics of a vertex that you get with Adobe Illustrator. This gives spline editing a familiar feel. Moreover, you can define multiple control points and manipulate surfaces in a fashion similar to pulling taffy, which makes it deceptively easy to create complex organic shapes.



MacroModel represents the next generation in 3-D-modeling software. In addition to providing precise numerical control over object data, the program lets you extrude objects along any path type to get unusual shapes such as the tubes shown here.



MacroModel's numerical controls over object data give you the precision of a CAD program, making it an ideal prototyping tool.

MacroModel also provides excellent controls for creating elaborate beveled edges.

One caveat for Swivel 3D users: Although MacroModel's new tools radically enhance the modeling experience, the program represents a significant departure from Swivel 3D's more free-form modeling approach.

Just Browsing

One of MacroModel's chief strengths is its precise, numerical control over most objects. The program displays editable values in browser windows. A separate browser window exists for each model element: objects, views, materials, and lights. Each browser window presents the hierarchical linking order, as well as the pertinent attributes, of all its elements.

You can select an element simply by clicking on its name in a browser window. This ability comes in handy if you need to select an object that's hidden behind other objects in the current view. Unfortunately, you can't shift-select multiple objects in browser windows. You can, however, move multiple objects in a hierarchy by moving the parent object, which in turn moves all the dependent objects.

You can edit positioning and scaling information for 3-D objects directly, using x, y, and z coordinates. A "virtual trackball" lets you change your orientation to a scene in an interactive, graphic fashion. Check boxes for each object attribute enable you to lock and constrain setting combinations, which makes it easy to duplicate the powerful ball-and-joint linking properties that are Swivel 3D's claim to fame.

Rendering

MacroModel's built-in-rendering quality is very good, and it offers the same smoking-fast Phong renderer Swivel 3D does. MacroModel can render Phong images with soft shadows and selectable levels of anti-aliasing. It even includes alpha-channel information for post-compositing in programs such as Adobe's Photoshop. Despite these features, most graphics and video professionals will probably want to resort to a more powerful program for rendering and animation. MacroMind Three-D, for example, has been updated to directly support the import of MacroModel geometry files.

Similarly, MacroModel's texturing



With MacroModel's familiar spline-based controls, you can select an object's control points and pull them out to create more-sophisticated objects.

and lighting options won't satisfy sophisticated users. The program's standard textures — plastic, glass, marble, stippled, and spatter — are useful, but they don't offer the depth of textures found in products such as Infini-D. Moreover, you can't create custom PICT-based texture, bump, transparency, or specular maps — a serious limitation if you're creating package designs.

Lighting is adequate but somewhat disappointing. Although it's possible to change the color, intensity, and softness of a light, the program provides only two light types — distant and local. More light types, such as spotlights, would be a welcome addition.

MacroModel eats up system resources. Twenty megabytes of RAM and a math coprocessor just begin to satisfy its appetite — we encountered "Out of Memory" problems on a Mac IIfx with 20 megabytes of RAM. For optimal performance, we recommend a Mac IIfx or Quadra-class machine with 32 or 64 megabytes of RAM. To be fair, the cost of additional memory is a small price to pay for MacroModel's modeling muscle.

MacroModel is a powerful, innovative modeling tool, but the initial release has some trouble spots. The vertices on adjoining 2-D cross sections have a tendency to misalign when you're stretching a skin over them. You can correct this problem by adjusting the rotation and positioning data of the cross sections, but it's frustrating.

More troublesome were problems that occurred when we exported MacroModel

files in DXF format to other programs. A basic model imported into StrataVision 3d lost some of its parts, and lathed objects with holes didn't export properly. Given that a primary use of MacroModel will be creating model files for export to other rendering and animation programs, the DXF gremlins are a troubling problem that Macromedia needs to address. Fortunately, MacroModel also supports the RIB format, a more complete facility for exporting geometry files.

MacroModel's documentation is useful, although it sometimes feels incomplete. It would benefit from more illustrations and examples, a more comprehensive tutorial, and more sample files on-disk. A separate, laminated quick-reference card is sorely lacking.

The Bottom Line

Although MacroModel suffers from a few rough edges, the program delivers enormous modeling power and represents a paradigm for 3-D-modeling interface design. If you're willing to invest the time required to learn it, the payback will be the ability to create shapes that would stump the average modeler.

VIDI's ModelerPro is in the same price range and offers similar capabilities, but MacroModel's unique and powerful interface bears consideration by anyone interested in the next-generation modeling environment. If it adds some bug fixes, tweaks, and improved documentation, Macromedia will have a product we can recommend without reservation.

— David Biedny

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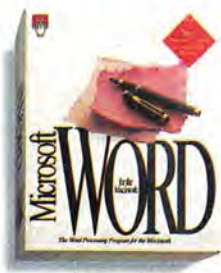


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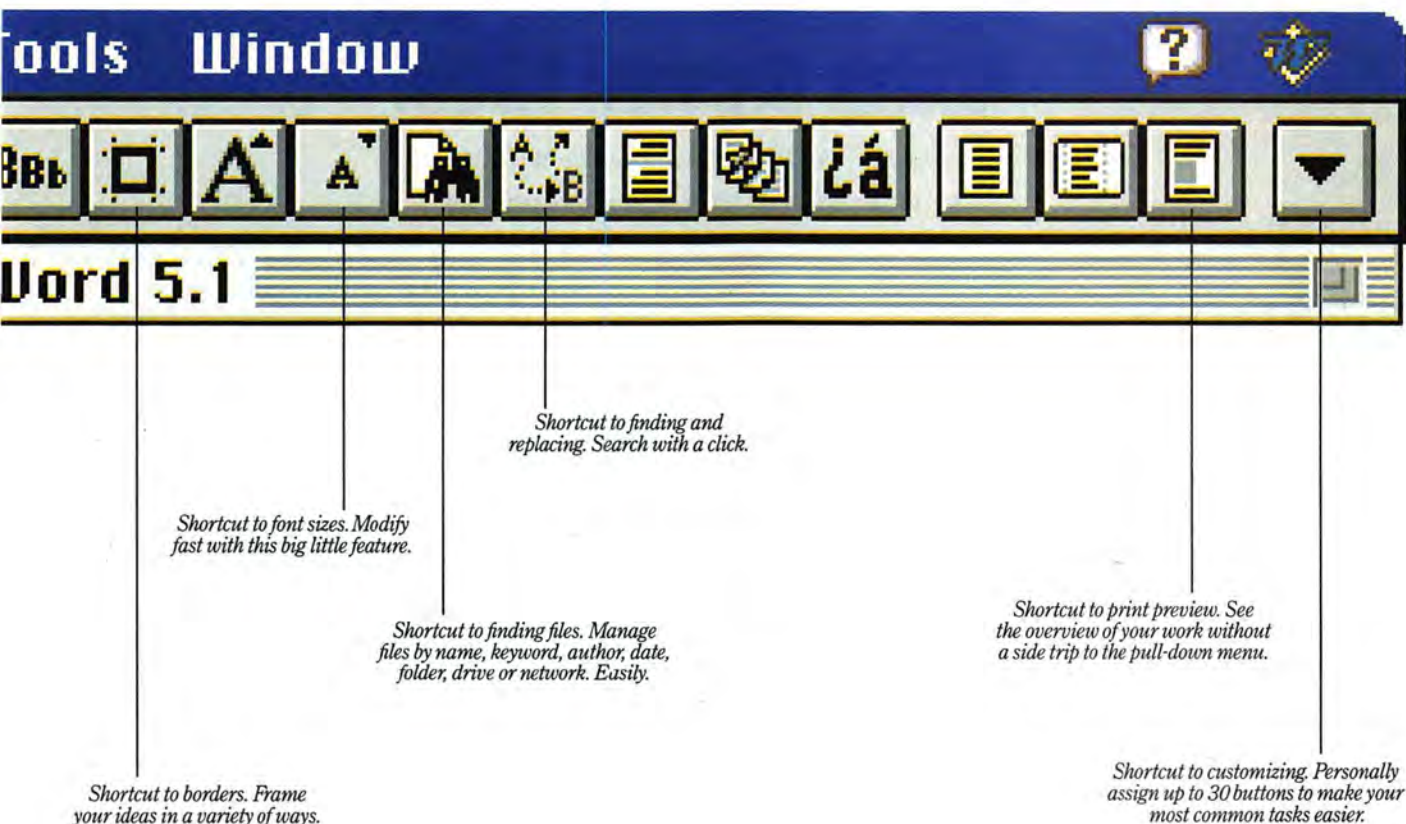
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PRINTERS

GCC WriteMove II and Kodak Diconix 180si

*Slim and fast, the PowerBook-friendly WriteMove II
whips the Diconix 180si at portable printing.*

With the introduction of two truly portable printers, the mobile office just got more complete. The GCC WriteMove II and the Kodak Diconix 180si are both designed to travel, but the similarities end there. With its slim profile, speed, and print quality, the PowerBook-friendly WriteMove II stands head and shoulders above the Diconix 180si for on-the-road printing of laser-quality letters and reports.

Compact and Complete

The \$599 WriteMove II comes complete with a power adapter, a battery, two ribbons, three disks, a user's guide, and a serial cable. The \$419 Kodak Diconix 180si, on the other hand, is clearly on friendlier terms with DOS machines than with Macs. It comes with a power adapter, a single inkjet cartridge, and one disk with — you guessed it — a DOS printer driver. Mac users must purchase the \$39.95 Mpower 180si Interface Kit to get the necessary printer driver, user's guide, and serial cable. In addition, the 3-pound Diconix 180si's bulky measurements make it almost twice the size of the svelte, briefcase-sized, 2.5-pound WriteMove II (2 x 11.5 x 3.5 inches). Moreover, the WriteMove II has PowerBook written all over it — even the color of its plastic case matches the color of the PowerBooks.

Initial setup of the Diconix 180si is complicated by the printer's documentation, which is organized haphazardly and focuses excessively on DOS subjects. In marked contrast, the WriteMove II's manual is laid out in a straightforward manner and is full of illustrations and step-by-step instructions.

Paper Handling

The WriteMove II has two paper-loading options. For envelopes, laser transparencies, and thick stock that doesn't take kindly to bending, you turn the



GCC WriteMove II
Manufactured by: GCC
Technologies, 580 Winter Street,
Waltham, MA 02154; 800-422-
7777 or 617-890-0880.
List Price: Printer, \$599;
additional battery, \$89; 5 ribbons,
\$25; 25 ribbons, \$119.



Kodak Diconix 180si
Manufactured by: Eastman
Kodak Co., 209 Burlington Street,
Bedford, MA 01730; 800-422-7777
or 617-275-5800.
List Price: Printer, \$419; Mpower
180si Interface Kit, \$39.95; print
cartridge, \$13.95.

printer onto its back and insert the media into the feed slot on the bottom. For single sheets that don't require a straight path, you can use the printer's paper tray, which comes complete with paper guides. In either scenario, when the paper reaches the rollers, the printer automatically pulls it into the correct position for printing.

The Diconix 180si accepts paper from

the rear only. You can't print envelopes, and loading single sheets is as cumbersome as it is with a manual typewriter. You open the top cover, pull the bail forward, manually insert the paper in the rear, push the bail back, and close the cover — all this without the help of guides to ensure that the paper feeds squarely. To be fair, the Diconix 180si accepts standard tractor-feed paper more easily, but who uses fanfold paper nowadays?

Also worth noting is that the Diconix 180si's horizontal print path is limited to 7.1 inches. You can't print text or graphics beyond this width, which means that the right and left margins must total at least 1.4 inches for a standard letter-sized page. The WriteMove II's 7.67-inch maximum printable width gives you a bit more breathing room.

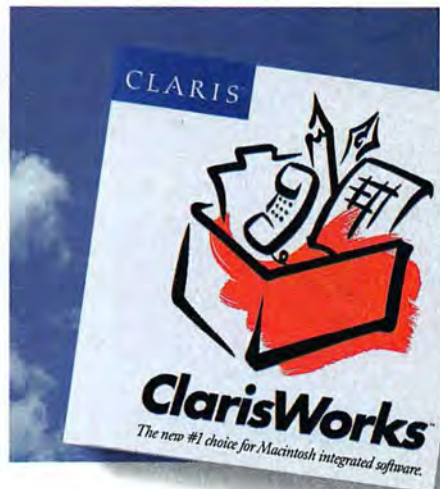
A bare-bones printer driver is the only piece of software that comes in the Diconix Mpower 180si Interface Kit. It offers the customary features for reducing/enlarging, changing page orientation, choosing paper size, and printing specific pages. There are also curious options for generating cover pages (on a network printer, sure, but what's the use with a PowerBook printer?) and for printing text in Draft mode, using the printer's built-in fonts (an obvious vestige of the



GCC's WriteMove II and Kodak's Diconix 180si are two printers made to travel. Of the pair, the WriteMove II is a better match with PowerBooks and offers better speed and print quality.

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NEW ON THE MENU REVIEWS

Pow Pow

The WriteMove II's crisp output (top) looks as if it came from a laser printer. In contrast, the Diconix 180si's output (bottom) tends to bleed.

DOS heritage). We'd trade these features in a flash for a much-needed print-preview option.

By contrast, not only does the WriteMove II's printer driver provide a print-preview option but it also lets you spool individual jobs for batch printing later. You can even print in the background, although performance is so degraded that you won't get much work done while the printer is operating. The WriteMove II also lets you specify custom paper sizes.

Neither printer is a speed demon, but given that they're designed for mobility and not as primary printers, this isn't a big drawback. When connected to an 8-megabyte PowerBook 140 running System 7.0.1, the WriteMove II took about 1.5 minutes to print one page of double-spaced text. The Diconix 180si took twice as long to print the same document.

The WriteMove II's 360-dpi thermal-fusion print head melts wax from the ribbon directly onto paper, and the hard copy is crisp and clear — virtually indistinguishable from laser-printer output. GCC provides one single-strike ribbon that's good for approximately 20 pages and one multistrike ribbon that can print 80 pages, of gradually deteriorating quality. With its much coarser 192-dpi print head, the Diconix 180si can't match the WriteMove II's print quality. Even when the printer's operating at its best setting, the Diconix 180si's output tends to bleed.

The WriteMove II comes with Adobe Type Manager and 21 Adobe Type 1 fonts, which give the best printing results. The Diconix 180si also works with ATM and TrueType, but neither are provided.

In battery operation, the WriteMove II behaves just like a PowerBook. When

you're away from an AC outlet, the printer's slim, proprietary NiCad battery provides enough power to print about 20 pages of double-spaced text. To recharge, you simply plug in the printer's AC adapter. The WriteMove II is designed to use the PowerBook's AC adapter, so you have to lug only one adapter when you hit the road. Recharging takes two to six hours, depending on the discharge state. To conserve battery life, the WriteMove II puts itself to sleep after a minute of inactivity. To wake it, you can either press the On Line button or simply print to it. If the printer remains in Sleep mode for two minutes, it turns itself off.

The Diconix 180si also runs on battery power. Five C-sized NiCad batteries (not included) fit cleverly inside the platen, providing sufficient power for 50 minutes of continuous printing (about 17 pages of double-spaced text in our tests). To recharge the batteries, you attach AC power and turn on the printer while holding down the Font (Recharge) button. Recharging takes ten hours — lights on the front of the unit indicate progress.

The Bottom Line

We found the WriteMove II superior to the Diconix 180si in every way. The Diconix 180si can't hide its true identity as a DOS product that's cobbled together to work with Macs. The WriteMove II, on the other hand, is clearly designed from the ground up to perfectly complement Apple's PowerBooks — which it does. It's true that the Diconix 180si costs about \$100 less than the WriteMove II, but the price difference doesn't make up for its drawbacks. In short, have WriteMove II, will travel.

— Owen W. Linzmayer

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MiniCad+ 4

Graphsoft's midrange CAD program goes to the head of its class for architectural design.

MiniCad+ 4 is a major update to Graphsoft's feature-packed 2-D/3-D CAD program. With an improved interface, enhanced 3-D-modeling capabilities, and several new architectural-design features, MiniCad+ 4 easily bests market leader Claris CAD as the midrange CAD program of choice for architectural applications. In fact, with the latest version's new high-end features, MiniCad+ 4 begins to nip at the heels of the Mac's most sophisticated CAD programs, including Autodesk's AutoCAD, Ashlar's Vellum 3D, Intergraph's MicroStation Mac, and Schlumberger's MacBRAVO!

Interface enhancements to MiniCad+ include new rulers and scroll bars in the drawing window. A welcome addition, the rulers help establish a frame of reference that's particularly valuable when you're working with different magnification levels. The scroll bars augment the hand tool and make large panning operations possible. In addition, menu commands are more logically arranged than in previous versions, and the cryptic alphanumeric symbols formerly used



MiniCad+ 4
Published by: Graphsoft, Inc.,
 8370 Court Avenue, Suite 202,
 Ellicott City, MD 21043;
 410-461-9488.
Version: 4.0.
List Price: \$795.

to conserve menu space are gone.

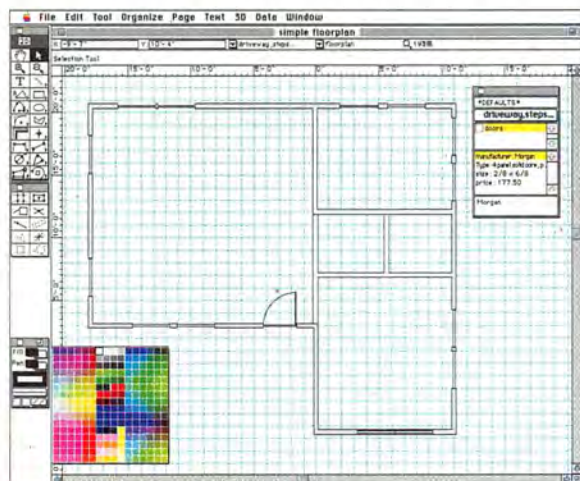
A new mode bar, located just below the main menu bar, displays context-sensitive tool modifiers and prompts. Unfortunately, the mode bar suffers from a lack of consistency. When you're using the regular-polygon tool, for example, the tool's command modifiers appear in the mode bar as expected; when you're using the circle and arc tools, however, the modifiers appear as pop-up selections on the tool palette.

Also new is the Attribute palette, which provides a handy way to set and alter pen and fill patterns, color, line styles and weights, and line markers such as arrowheads. Unfortunately, you must use a

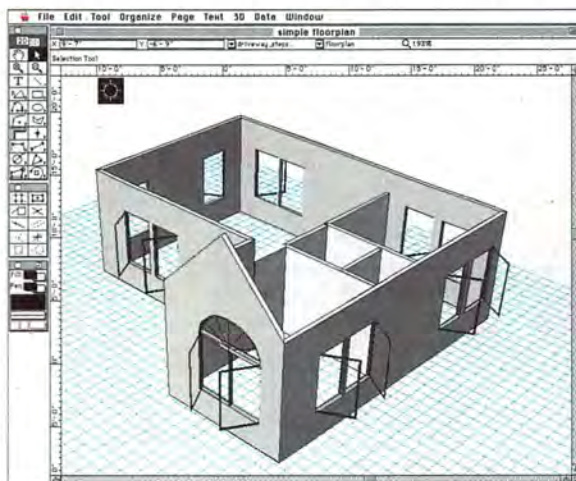
separate preference setting for dimension arrowheads — another interface inconsistency.

Many of MiniCad+'s new features are 3-D-related. The SmartCursor, for example, now provides on-screen feedback for 3-D as well as 2-D geometry. Moreover, MiniCad+ 4 gives you more-immediate access to the program's 3-D environment. You can now toggle between the program's 2-D and 3-D tool palettes simply by clicking on a button. (The previous version required you to use a separate 3-D menu.)

New 3-D visualization aids — including walk-throughs, flyovers, and automatic section generation — are impressive in a package that costs less than \$1,000. The 3-D walk-through feature is meant primarily for viewing drawings from different vantage points, however, and not for the kind of model conceptualization made possible by Virtus WalkThrough. Activating MiniCad+'s Walkthrough command enables you to move forward, backward, left, and right by moving the cursor to the top, bottom, left, and right of the screen, respectively.



MiniCad+ 4 builds on the product's strength as a tool for architectural design. The program's enhanced interface features a new Attribute palette (lower left) that makes it easy to modify pen and fill patterns.



Integration between MiniCad+'s 2-D and 3-D environments is much improved, although moving between the two views is still not intuitive. Shown here is a rendered view of the 2-D drawing that appears to the left of this figure.

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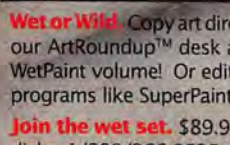
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CIRCLE 92 ON READER SERVICE CARD.

NEW ON THE MENU REVIEWS

You can use the Option key to tilt your viewpoint up or down, depending on the position of your cursor.

Architectural designers will find MiniCad+ 4's new hybrid 2-D/3-D wall, roof, floor, and symbol objects (symbols include windows, doors, and the like) a plus for moving from 2-D drawings to 3-D models. By converting the 2-D geometry of objects to 3-D and storing both sets of data, the program can display the 3-D counterparts of 2-D objects automatically when users move from plan view to model view, saving considerable time and effort.

Rounding out the list of major new features are Layer Links and Smart Walls. With Layer Links, you can break a large drawing into a composite of linked layers and work with a single layer at a time rather than with the entire drawing, thus reducing the drawing's complexity and speeding screen-redraw performance. Another real time-saver, the Smart Walls feature allows walls to automatically open up when you want to add and align symbols such as windows.

Collectively, these new features greatly enhance MiniCad+ 4's position as an architectural CAD tool, making it a less expensive but capable alternative to sophisticated architectural CAD programs such as ArchiCAD and DynaPerspective.

In addition to its new enhancements, MiniCad+ 4 boasts several noteworthy features that have traditionally set it apart from the competition. Built-in database and spreadsheet capabilities, for example, make it easy to enter descriptive textual data associated with graphic objects—a boon to users who need to generate bills of material and cost estimates.

The package also includes a simple stand-alone Claris CAD translator that opens and converts Claris CAD documents. Although the program translates layers and most Claris CAD objects faithfully, dimensions don't carry over into MiniCad+ 4 intact and wall objects don't connect properly. We also noticed an occasional problem with the proper conversion of arcs.

The MiniPascal programming environment, introduced with MiniCad+ 2, gives third-party developers the tools for creating custom CAD applications. This programming environment extends MiniCad+ 4 by adding new commands and capabilities—anyone with a basic knowledge of Pascal can easily create MiniPascal procedure calls. The

MiniCad+ 4 package includes numerous sample procedures as well as a separate MiniPascal manual.

Another powerful MiniCad+ 4 feature worth mentioning is object classes. Classes are logical groups similar to layers but can be used across them—for example, you can use layers to define the floors of a building and classes to define electrical and plumbing services.

With its many enhancements, the new MiniCad+ 4 is at the top of its class for architectural CAD, but there's still room for improvement. Plotter support, for example, is not included, so if you require plotter output, you'll have to factor in the cost of Microspot's MacPlot Professional or Palomar's Plottergeist driver (\$250 to \$400).

Our other complaints are fairly minor. You must draw tangent lines in a particular order to prevent them from unpredictably flipping from side to side, and the screen doesn't always refresh completely after you've repositioned objects. Moreover, despite the current version's improved 2-D/3-D integration, moving between the two environments can be frustrating. The terminology is somewhat confusing, and the relationship between 3-D working planes and associated 2-D drawing surfaces is not clearly defined.

MiniCad+ 4 runs on all Macs equipped with at least 2 megabytes of RAM. System 7-equipped Macs should start with a minimum of 4 megabytes. MiniCad+ 4 and all its supplemental files require nearly 8 megabytes of disk space. A floating-point coprocessor is not required but is a decided asset if you intend to work with 3-D models and complex drawings.

The Bottom Line

Among CAD programs priced at less than \$1,000, MiniCad+ 4 stands out as a versatile powerhouse. Only DesignCAD 3D, from DesignCAD, Inc., can directly compete with MiniCad+ 4 in terms of features and pricing. However, DesignCAD 3D's tools are clearly aimed at mechanical-engineering applications, whereas MiniCad+ 4 features a host of bells and whistles designed specifically for architectural CAD. Despite a few remaining quibbles about its interface, which is much improved over that of the previous version, we rate MiniCad+ 4 at the top of its class for architectural applications.

—James K. Anders

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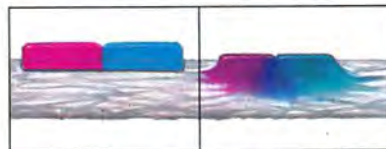
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VIDEO

Adobe Premiere 2.0

Adobe's digital-video-editing tool gains new special effects and links to professional editing systems.

Adobe wowed the QuickTime movie-making set with the first version of Adobe Premiere, but the recently released second version is likely to turn even more heads, particularly among the professional video crowd. Premiere 2.0 is a significant upgrade that adds a plethora of new special effects, incorporates direct support for Adobe Photoshop and PostScript fonts and graphics, and provides a bridge between the QuickTime and professional video worlds. It also fills a few cracks in the first version's implementation.

New Digitizing Capabilities

Premiere 2.0 retains much of the basic interface and conceptual design of version 1.0, but once you've started using the program, enhancements present themselves at every turn. To start, Premiere 2.0 corrects a drawback of the first version by letting you digitize movies from directly within the application, as long as you have the VDIG (video digitizer) driver for your video-capture board. The program provides full access to all controls supported by the respective VDIG driver, including color balancing, brightness, and contrast. You can also force



Adobe Premiere

Published by: Adobe Systems, Inc., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94043; 415-961-4400.

Version: 2.0.

List Price: \$695.

Premiere to digitize directly into RAM and then apply compression as a post-digitizing process, each of which gives you faster frame rates. We tested the SuperMac VideoSpigot and Radius VideoVision boards with Premiere and were able to digitize both video and sound simultaneously, without a hitch.

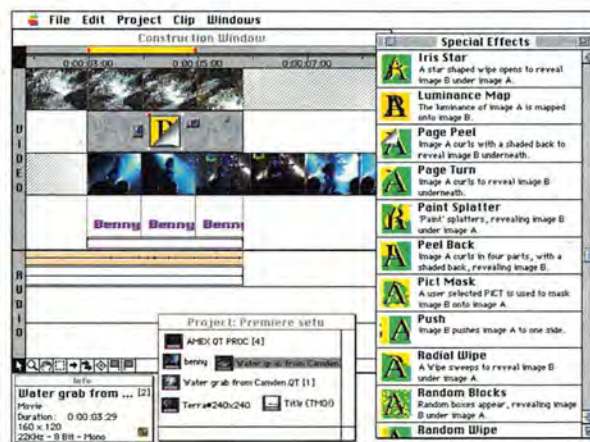
Another major drawback of version 1.0 was that Premiere routinely applied compression to every QuickTime movie it compiled, even if parts of the movie were already compressed and had remained unaltered in the editing process. By contrast, version 2.0 compresses only those segments of compiled movies that have been processed or modified.

With the new version, the Construction window displays icons that provide handy access to its most important

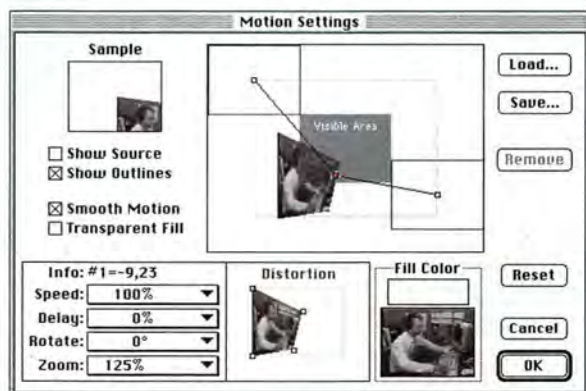
editing tools. New to the collection is the ripple tool, which lets you adjust the duration of a clip without disturbing the duration of other clips on the same track. You can also set In and Out points from directly within the Construction window rather than having to switch to individual movie windows, and the small Preview window is now fully resizable.

For improved performance during the edit and preview stages, Premiere 2.0 lets you create and work with miniature images of your original clips. When you're finished, you can use the Re-Find command to retrieve the original images for the final cut. The only drawback is that you must relocate and link each file manually — a daunting task if you're working with many movie and image files.

Adobe has dramatically expanded Premiere's controls and options for layering movie elements. Transparency options for superimposing movies and still images include luminance and chroma keying as well as a difference matte that calculates the difference between a pair of images or movies and creates an alpha mask with the results. Premiere's variety of mattes, combined



Adobe Premiere's new icons (lower left) provide easy access to frequently used editing tools.



With Premiere 2.0's new Motion settings, you can define paths along which clips move as they play. Support for multiple key frames lets you create fairly complex motion effects.



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with its fine-tuning sliders, give you the tools for dealing effectively with virtually any difficult compositing problem.

The only drawback to the Transparency feature is that the Settings dialog box displays only the superimposed image. It would be helpful if the program also displayed the background image to allow a more accurate preview of the mattes and options. In the current implementation of the program, you must render a portion of the movie in order to view the results of the Transparency options you've applied.

Premiere 2.0 boasts several new transition effects and filters. New, animated filters change over time, and the Color Offset filter lets you create pseudo-3-D movies (3-D glasses aren't included). Whizbang transition effects include the Cross Zoom (zooms in on one image, switches to a second, and zooms out), the Cube Spin (images appear to be mapped to the sides of a spinning cube), and the Page Peel effects. Among the organic transitions are Paint Splatter, a wonderful Random Blocks effect, and Random Wipe (the edges of the wipe are randomly jagged — a great improvement on standard wipes).

With the new Motion command, you can define paths along which clips can move as they play. To further enhance the effect, you can apply animated resizing, rotation, and distortion effects as the clips move. Premiere's Motion-command interface is clear and intuitive and provides good visual controls as well as a real-time preview of the resulting movie. The Motion command also allows for multiple key frames — essential for creating complex motion effects.

We noticed, however, that rendered clips moving along paths suffered from severe motion jerkiness and unevenness. Fortunately, Adobe has already solved this problem with a maintenance release that should be available by the time this review appears.

Premiere 2.0 lets you import EPS and PostScript graphics and render them into anti-aliased bit maps, complete with the corresponding anti-aliased alpha channels. This permits clean layering of images on top of still or moving backgrounds. Also welcome is the program's new integrated titler, with which you can create clean, anti-aliased type (with ATM or TrueType fonts) as well as basic shapes. Sliders let you adjust drop shadows and transparency.

Version 2.0 introduces the new Film-strip file format, which makes it easy to export video clips from Premiere to Photoshop for retouching, processing, and painting. This provides a great way to create complex composites, but unfortunately, there's no automatic registration or onionskinning. Even so, this feature opens the door to a staggering variety of special-effects possibilities.

EDL Support

Although Premiere 2.0 offers a slew of features for QuickTime videophiles, it also provides several tools aimed squarely at video professionals. The program's support for the EDL (Edit Decision List) means, in theory, that QuickTime movies can include time code such as the industry-standard SMPTE (Society of Motion Picture and Television Engineers). Once you've finished editing a movie in Premiere, you can use the EDL to control high-end on-line-editing systems such as the CMX 3400 and 3600, the Sony BVE, and the Grass Valley. Even some of Premiere's transition effects can be replicated and translated. The only problem is that this scenario requires a 30-frame-per-second QuickTime video grabber with special hooks for storing SMPTE time code — an item that's currently not available, although we may see such a board introduced by a third-party manufacturer later this year.

Premiere's documentation is clearly written but lacks meaningful levels of detail on some of the program's more complex features. One especially helpful portion of the manual, however, is the full-color, informative Tips and Techniques section, which outlines strategies for achieving advanced special effects.

Premiere 1.0 owners can upgrade to the new version of the program for \$149.

The Bottom Line

Adobe Premiere 2.0 not only does a great job of addressing its predecessor's weak spots but it also significantly enhances the program's ease of use, editing capabilities, and special-effects features. Even the most discerning Spielberg wannabes will be hard-pressed to come up with a wish list of missing features. Furthermore, with Premiere's EDL support, video professionals are likely to view the Mac more seriously as a viable editing tool.

— David Biedny

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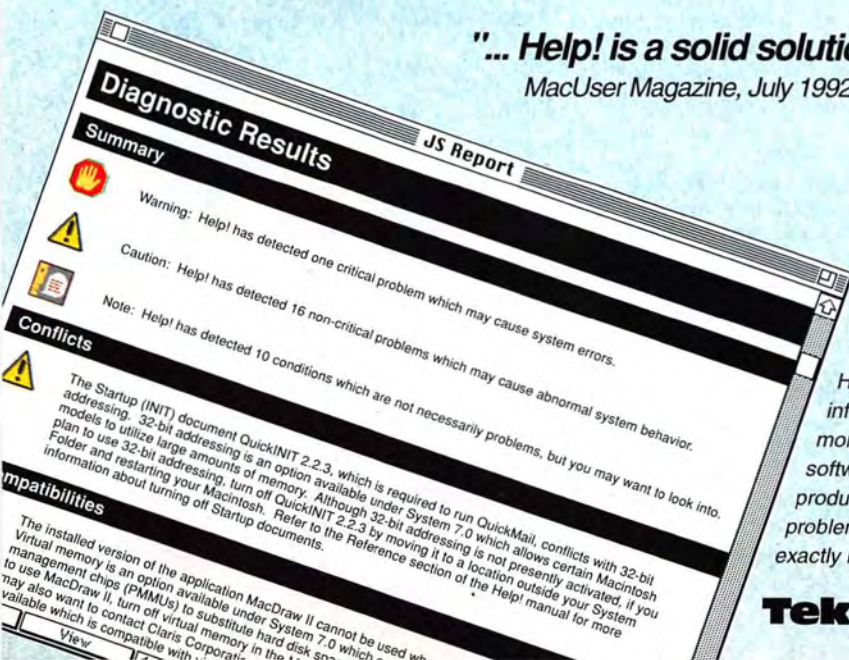


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VIDEO

VideoVision

Affordable, flicker-free video output to tape makes the VideoVision a winner for multimedia presenters.

Methods for getting NTSC (National Television Standards Committee) video into and out of the Mac have been far from plug-and-play. Until now, that is. The new VideoVision, from Radius, is an integrated system that not only gives you relatively clean, flicker-free composite-video output (in both NTSC and the European PAL formats) but also offers a built-in 24-bit-display interface, video in a window, and QuickTime and 8-bit stereo sound digitizing. And all this for \$2,399 — a significant savings over the cost of previous high-quality Mac video-output products.

NuBus Design

Originally developed by Apple, the VideoVision is tailor-made for combining graphics, text, sound, and video and printing the results to videotape. The hardware consists of a NuBus card and an external breakout box that contains all the required video and audio jacks. The box and the Mac's display system connect to the NuBus card. The VideoVision package also provides an S-video cable, a single set of RCA/audio cables for connecting the box to a video source, a wall-mounting plate for the breakout box, software, and documentation.

The breakout box allows simultaneous connection of two video/stereo audio-input sources, a video/stereo audio output, a separate audio-mix input, and an external connector for third-party hardware accessories such as hardware for genlocking (synchronizing the VideoVision with an external video source). The box's S-video-connector support for video input and output ensures a relatively high-quality signal. (Of course, to take advantage of this feature, your video gear must support S-video.)

The VideoVision also supports the French SECAM video standard for input. An unexpected benefit of the VideoVision setup is that you can directly translate NTSC and PAL to SECAM simply by selecting the appropriate formats in the software routing controls.



VideoVision

Manufactured by: Radius, Inc.,
1710 Fortune Drive, San Jose, CA
95131; 408-434-1010.
List Price: \$2,399.

Installing the VideoVision hardware and software is straightforward. The package includes the standard RadiusWare video-support software, which provides such niceties as tear-off menus and enlarged font sizes for the menu bar.

QuickTime Digitizer

Also supplied is a VDIG (video digitizer) driver for digitizing QuickTime movies from within applications such as DiVA's VideoShop and Adobe Premiere 2.0. The VDIG driver lets you switch video sources from within the software as well as control other aspects of the board. When used without another display board installed, the VideoVision drives your primary monitor. Video is echoed to the selected video-out channel, and incoming audio is echoed by the Mac's internal speaker.

We tested the standard RCA and S-video inputs with a Sony consumer Hi-8 camcorder and a Pioneer laserdisc system. When digitizing video from within VideoShop, the VideoVision VDIG driver provided full control over sound settings and incoming-video parameters such as hue, saturation, and brightness. Frame rate, a function of CPU horsepower, varies — we achieved eight to ten frames per second with a Mac IIx running System 7.0.1.

One caveat to MacroMind Director users: The VideoVision ships with a full-featured XObject for controlling the hardware from within Director, but you'll run into memory problems if you repeatedly invoke the XObject from within Director to display video in a window. We partially resolved this problem by using Lingo workarounds (periodically

flushing and reloading the XObject). Radius is working with Macromedia to provide a more transparent solution.

Flicker-Free

The VideoVision's most compelling feature is its video-output quality, which is on a par with that of the similarly priced VideoLogic Mediator board. However, the Mediator provides only video-out capabilities; it lacks the VideoVision's video-in-a-window, QuickTime grabbing, and audio-input capabilities. The VideoVision uses a color-convolution technique developed by Apple that dramatically reduces flicker. We noticed some bleeding and smearing of color graphics, however, especially with highly saturated red and green tones, so choose your colors carefully.

The system handles sound well. You can mix video-source sound with separate audio input — great for adding voice annotation to presentations — and specify custom key combinations for fading between sound sources. The VDIG-driver controls also let you set overall audio levels as well as bass and treble. However, the VideoVision's sound sampling is limited to 8-bit, 22-kilohertz stereo; this is a drawback for



The VideoVision is the first reasonably priced plug-and-play solution for combining graphics, text, sound, and video on the Mac and printing the flicker-free results to videotape. Core components are a NuBus card and an external breakout box.

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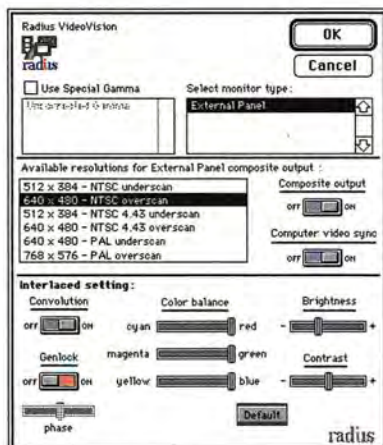
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You control the VideoVision hardware with a control panel that lets you select settings for video-output modes, brightness and color, and video synchronization.

professional applications.

Also noteworthy is the proprietary H-Bus adapter plug on the VideoVision card. The H-Bus, with a transfer-rate specification of 60 megabytes per second, can conceivably be used to add modular expansion cards such as full-screen, 30-frame-per-second QuickTime accelerators; hardware-integrated titling; and more. However, at press time, Radius had made no announcements regarding optional H-Bus products.

The board's built-in 24-bit-display interface supports 12- and 13-inch monitors and provides 8-bit support for larger monitors. DiVA VideoShop (video-editing software) and Macromedia Action (animation software) are both bundled. Novice QuickTime producers will find these programs useful starting points for driving the VideoVision hardware.

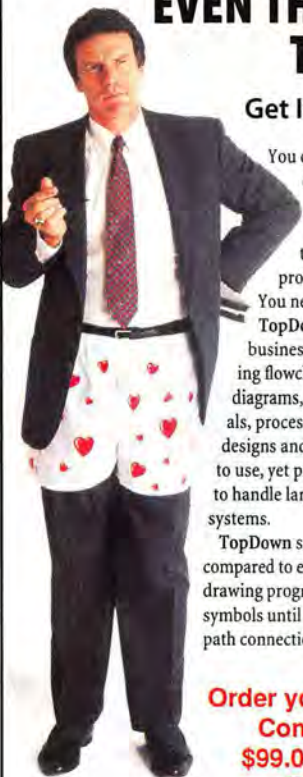
The Bottom Line

Although the VideoVision's NTSC video output may not meet the most demanding broadcast-quality standards, the program is viable for business and multimedia users looking for a way to output Mac-based animations and presentations to videotape or projection systems. Moreover, the VideoVision is well integrated, serving up an impressive feature set teamed with built-in display support. All in all, the VideoVision's solid QuickTime digitizer and affordable flicker-free video output make it a surefire answer to many a multimedia user's prayers.

— David Biedny

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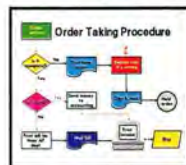
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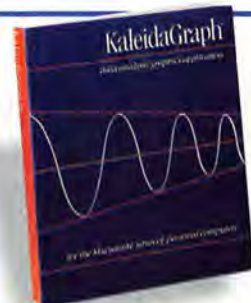
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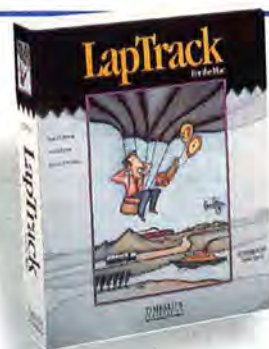
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*Timeworks ... 30 day MBG

- 7115 **Publish It! Easy 3.0** 109.

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*Virtus Corporation ... 30 day MBG

- 4488 **WalkThrough 1.1** 309.

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- 2687 **SuperDisk! 49. 1608 More Disk Space 42.**



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- 1074 **System 7.1 79. 3413 MultiPack** ... 349.
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*ASD Software ... 30 day MBG

- 7085 **FileGuard 2.7.2 (1 user)** 138.

*Atticus Software ... 60 day MBG

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*Berkeley Systems ... 30 day MBG

- 2198 **More After Dark (M.A.D.)** 23.
- 5737 **After Dark 2.0V 28. 2196 Bundle** ... 39.
- 7987 **Art of Darkness (Peachpit Press)** 16.
- 3392 **Star Trek: The Screen Saver** 34.

*Casa Blanca Works ... 30 day MBG

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*Claris ... 30 day MBG

- 8734 **HyperCard Development Kit 2.1** 139.

*Connectix ... 30 day MBG

- 8441 **CPU (Connectix PowerBook Utilities)** ... 49.

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- 7310 **TimeLog** 62. 7309 (10 Pack) 399.

*Dantz Development ... 30 day MBG

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- 5255 **Retrospect 147. 7945 Remote 1.3 264.**

- 7946 **Remote (10 Pak) 147. 3112 (50 Pak) 639.**

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- 5178 **FastBack Plus or 5725 DiskLock** ... 125.

- 7404 **DiskDoubler 52. 4838 AutoDoubler** .. 58.

FWB, Inc.

- 10198 **CD ToolKit** 49.

- 7929 **Hard Disk ToolKit Personal Edition** ... 49.

- 2999 **Hard Disk ToolKit 1.1.1** 125.

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- 6296 **Intermission** .. 29. 3731 **OnCue II** .. 55.

*Inline Design ... 30 day MBG

- 1744 **Icon 7** 31. 9843 **Inline Sync 1.0 79.**

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- 2913 **Redux 1.63** 49. 1740 **Deluxe** 92.

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- 7552 **Rapid Trak** 56.

*Kent Marsh Ltd. ... 30 day MBG

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PLUMA, Inc.
8704 **Cause or 8713 Net Effect** ea. 185.

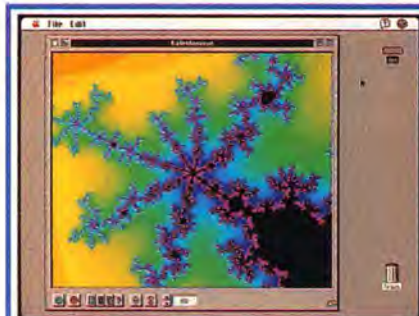


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8266 **SimEarth 1.1** 40.
1910 **SimLife...** 41. 3307 **A-Train** 39.
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- ★ **DIVA Corporation ... 30 day MBG**
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- E-Machines**
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- 9068 **ColorLink SX/2** 629. 9069 **SX/T**..... 629.
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- 7651 **Action! 2.0**..... 349.
- 4598 **MacRecorder Sound System PRO**... 239.
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- 1736 **Precision Color Display/20S**..... 2499.
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- 8944 **RasterOps 24STV** 819.
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- 3683 **Backpac 1, 3679 2, or 2176 3** ea. 44.
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2864	PLI Infinity Floptical Drive (21 MB)	369.	
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1603	DG60M	15. 2520 DG90M	19.
1895	QD2120	21. 3984 QD2120Q	27.



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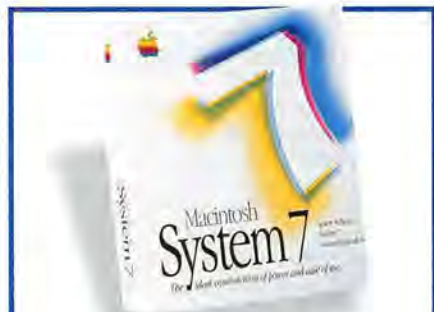
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7060	MicroSaver Security System	39.	

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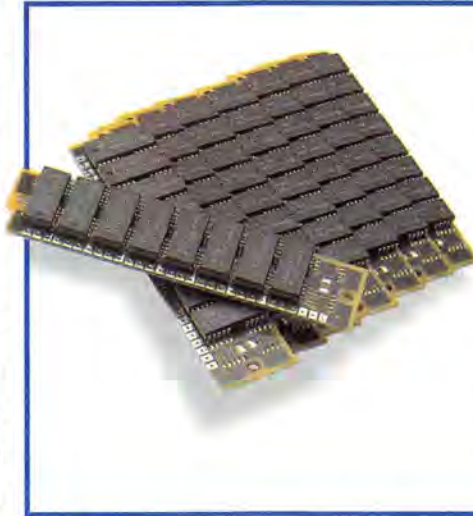
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UTILITIES

DocuComp II 1.0.1 and UpDiff 1.0

Two utilities take similar means to different ends by comparing two versions of the same document.

DocuComp II and UpDiff are both utilities that search for the differences between two documents. DocuComp II's focus is text files; it creates marked documents that illustrate how one document was revised to create another. UpDiff, on the other hand, compares two documents of any type and creates a third comprising the differences between them.


DocuComp II

DocuComp II uses pattern-recognition technology to examine two versions of the same document. It then creates a marked version that shows clearly how the original was revised. The program employs user-definable markers such as strikeouts and underlines to indicate text deleted from the original document and text inserted into the newer document.

DocuComp II handles these tasks with impressive accuracy. It uses two linked windows to display marked documents: one holds the original version, the other the revised. The Next Change command helps you quickly navigate through the marked changes in each document. Alternatively, DocuComp II can create a single composite from the two documents — by far its most useful feature. Editors, for example, can use the composite as the electronic equivalent of a manuscript marked with pencil. You can either print the composite or save it as a separate file to open with your word processor.

The program reads Microsoft Word, WordPerfect, and plain-text files. It brings nearly all the formatting of the original document into the composite document, including fonts, styles, and graphics. An option lets you selectively exclude text blocks from DocuComp II's reading process, but we encountered some problems getting this feature to work properly, especially when we set it to ignore large blocks of text.

DocuComp II is a useful tool, but we have two criticisms — we wish it could read more word-processing formats (how



DocuComp II
Published by: Advanced Software, 1095 E. Duane Avenue, Suite 103, Sunnyvale, CA 94086; 408-733-0745.
Version: 1.0.1.
List Price: \$179.95.



UpDiff
Published by: KyZen Corp., 77 Main Street, Northport, NY 11768; 609-354-3863.
Version: 1.0.
List Price: \$169.

about MacWrite II and WriteNow?) and mark formatting differences between documents.

UpDiff

UpDiff is an updating utility that aims to offer some of the same advantages as file-compression software. Unlike DocuComp II, UpDiff handles any type of application or document, including word-processing, spreadsheet, database, and graphics.

UpDiff works by extracting the differences between two versions of the same document and placing the information in

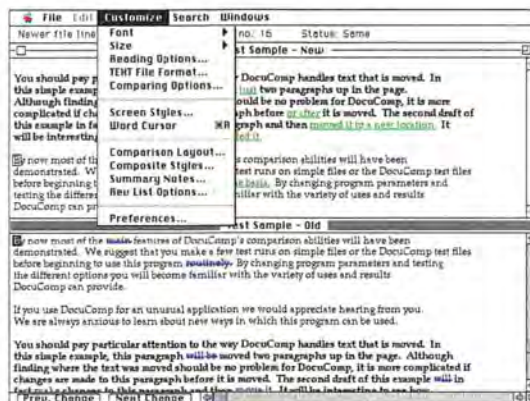
a diff file. Although you can't view or print the diff file, you can use it to update the original document.

Because diff files are typically much smaller than the files from which they're extracted, even when those files are compressed, transmitting diff files rather than full-sized updates over phone lines can substantially reduce telecommunication costs. Of course, the recipient must have the older version of the document in order to update it with the diff file.

UpDiff can result in spectacular savings in other cases too. For example, after analyzing two 125K Microsoft Word documents, one original and one moderately revised version, UpDiff created a 6K diff file. The revised Word file compressed by Compact Pro was 27K and took several seconds longer to create.

Overall, however, UpDiff's approach isn't that effective. The greater the difference between two documents, the larger the diff file will be. An even more significant limitation is that you must have both the original document and the UpDiff application to take advantage of the diff file. By contrast, compression programs such as Compact Pro can create self-extracting files that don't require a separate application.

Because UpDiff works with any type of file, using diff files might be a handy alternative to using updater utilities for



DocuComp II takes the drudgery out of comparing different versions of the same word-processing document. Shown here are the original and the revised versions of a document: Deleted text is indicated by strikeouts, insertions by underlines, and moved text by boldface.



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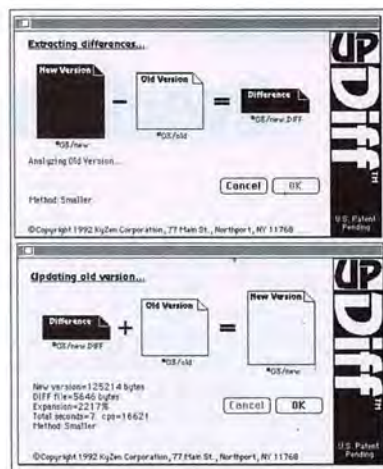
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UpDiff analyzes two versions of any file type and extracts the differences. Unfortunately, design limitations make it a less-than-practical alternative to compression software for cutting file-transmission costs.

supplying program upgrades to registered software users. To test this assumption, we created a diff file by analyzing two versions of the popular Suitcase utility. The diff file was 32K; the compressed version of Suitcase's own updater utility was a significantly larger 47K.

However, the Suitcase updater utility updates *any* earlier version of Suitcase. UpDiff works only with the older Suitcase version used to create the diff file. Moreover, if users make any modifications to the original software, the diff file won't be able to update the application. And, of course, recipients of the diff file must also have the UpDiff application.

With very large files, UpDiff loses every advantage. A diff file created with two versions of a 1-megabyte MacDraw Pro file was even larger than the files compressed with Compact Pro. UpDiff's speed advantage collapsed here as well—it took almost 15 minutes to create the diff file, as opposed to about 2 minutes with Compact Pro.

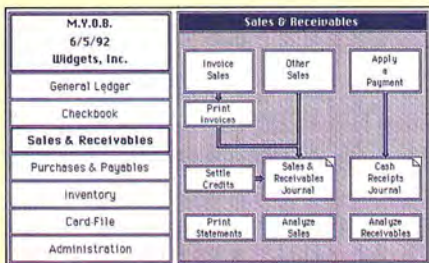
The Bottom Line

Of the two document-comparison utilities, DocuComp II is by far the most useful, successfully speeding the process of reviewing document changes. As for UpDiff, the technology behind its file compression and updating is impressive, but given its limitations, it's simply outdistanced by more-traditional file-compression utilities.

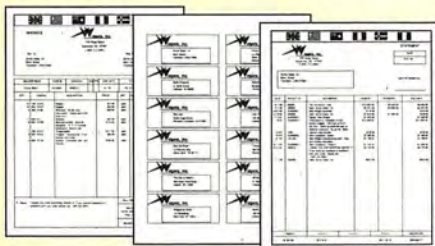
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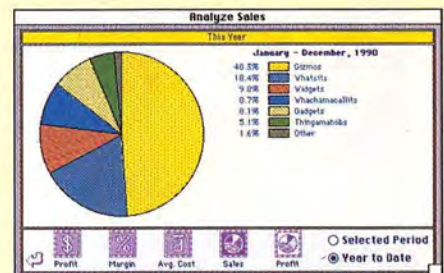


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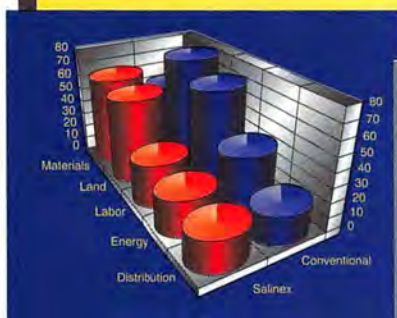
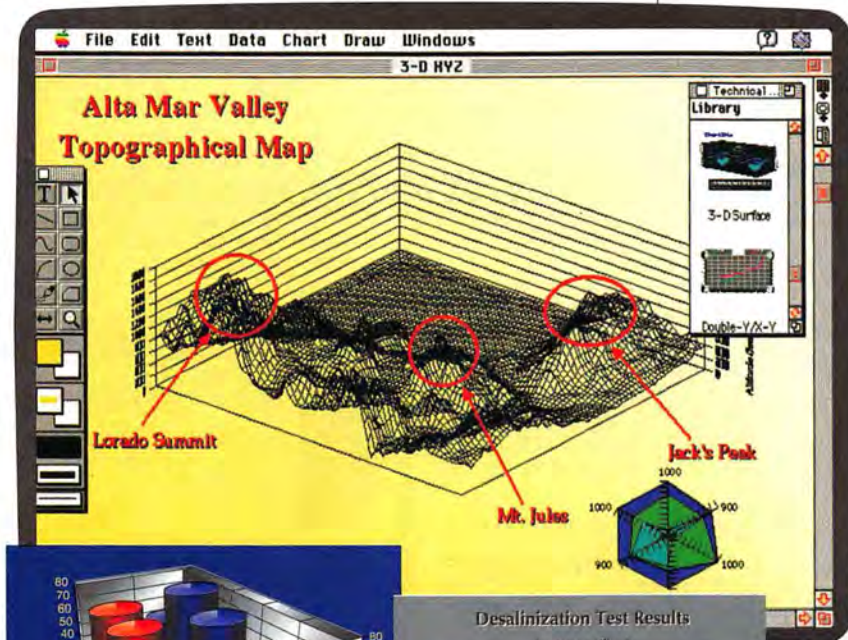
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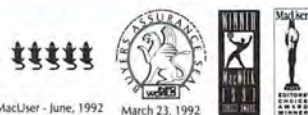


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PowerBook
Utilities**



In the PowerBook-utility race, CPU-Connectix PowerBook Utilities was first out the gate, and continual development may well keep it at the front of the pack. CPU addresses PowerBook annoyances ranging from major (battery management) to minor (disappearing cursors), all in a single multipage control panel.

For battery management, CPU gives you instant hard-drive spindown, backlight dimming, and system sleep plus the ability to set backlight dimming (as well as sleep and spindown) to occur after a timed period of inactivity. You can invoke any of the instant measures from the keyboard or create combinations of power-saving states (including processor rest) that you can access from CPU's ever-present menu to choose trade-offs between battery power and computing power.

CPU's menu bar shows the current time, date, battery charge, battery time remaining, and processor speed. The estimate of battery time remaining is about as accurate as any other predictive method (which is to say, sometimes it's right), but the slowly draining icon that indicates the battery charge is much better — we found it more accurate than SuperClock's PowerBook battery-charge icon. You also get a countdown before the hard drive spins down, so you can perform drive-intensive tasks, such as saving a document, prior to spindown rather than waste the power needed to spin the drive up again.

CPU tackles the PowerBook's disappearing-cursor and awkward-trackball problems with several handy options. For cursor control, you have the option of thin/thicker/thickest text cursors and a flashing-blob cursor finder. And if you're all thumbs with the trackball, you can choose to have menus drop down when you click on or point at the menu title, so you don't have to roll the ball and hold down the button at the same time. You can also control menus and dialog boxes from the keyboard by simply typing the discreetly underlined letter in each

command word, à la Windows.

CPU's first revision (version 1.0i, free to registered users) includes several fixes and changes. Among them: The system no longer goes to sleep during modem activity; backlighting no longer insists on coming on when you've turned it off manually; the screen saver now works with HyperCard; and the battery reader is more accurate.

Connectix Corp., 2655 Campus Drive, San Mateo, CA 94403; 800-950-5880 or 415-571-5100. Version 1.0i. \$99.

— Sharon Zardetto Aker



Audioshop



Let's face it — more of us use CD-ROM drives to play our favorite tunes than we do to access the truckloads of information available as CD-ROM data. Audioshop, from Opcode Systems, not only takes on the pedestrian job of playing audio CDs but also adds the ability to record, play, and edit digitized sounds.

Audioshop's interface resembles the front panel of an audio CD player. Its features include standard transport controls, a time display (switchable to reflect the time into a track or the remaining time on the CD, and so on), and a Sort button. For controlling your digitized sounds, Audioshop includes a volume slider and a series of buttons that determine the rate at which your sound plays.

Audioshop saves directories of CD tracks and sampled audio tracks as *playlists*. A playlist can be as simple as the tracks on a single audio CD or as complex as a mixture of audio-CD and other digitized sounds (Audioshop supports the Audio IFF, Resource, SoundEdit, HyperCard, Director, and QuickTime formats — in fact, it's the first product that lets you edit QuickTime sounds). For each track on a playlist, you can set start and stop points (so, for example, you can skip the grandiose intro to the Steve Miller Band's "Fly Like an Eagle") and the number of times you want the track repeated.

To record digital audio, you need either a Mac with a built-in microphone or a recording device such as Macromedia's MacRecorder. Audioshop supplies a set of editing tools for changing pitch; creating fade-ins and fade-outs; reversing the sound; and adding special effects such as echo, flange, and vibrato.

Audioshop is easy to use and blessed

with an engaging interface, but it isn't perfect. For instance, the Fast Forward button doesn't work when you're playing an audio CD on a dual-speed CD-ROM drive such as the NEC CDR-74. Also, sound-intensive games can interfere with the background playing of audio CDs. Unlike in Macromedia's SoundEdit Pro sound-recording-and-editing software, recording time in Audioshop is confined to the application's available memory. (SoundEdit Pro provides more-comprehensive editing features — but unfortunately at approximately three times the price of Audioshop.)

Despite a few quirks and limited editing capabilities, Audioshop is sure to be an entertaining addition to any Mac-audiophile's library.

Opcode Systems, Inc., 3950 Fabian Way, Palo Alto, CA 94306; 415-856-3333. Version 1.03. \$89.95.

— Christopher Breen



Silver Cloud



If your network is so big that there's too much to choose from in your Chooser, it may be time to replace that Apple Chooser with AG Group's Silver Cloud, a "hierarchical zone manager" designed to simplify the process of finding and selecting shared devices in medium-to-large networks.

Although Silver Cloud inherits the basic size and structure of the Chooser's three scrolling areas (Services, Zones, and Devices) in its static, nonresizable window, it adds a significant number of Finder-like features to aid in the choosing process, effectively giving the Chooser a much needed face-lift. With Silver Cloud, you can create zone folders to set up a hierarchical view of your network, create device aliases and folders to group favorite devices, hide irrelevant zones, and use a Find by Name command to search through a group of zones for a particular device. You can also view devices by icon, small icon, or name. Unfortunately, the Undo command isn't fully implemented in this version.

Silver Cloud's additional organizational and security advantages will appeal to network administrators. Its hiding and locking features let administrators pre-configure network views for multiple classes of users, concealing the zones that users have no need to access — and also

providing the added benefit of reducing unnecessary traffic (an important consideration for networks with wide-area links, which have costly per-packet charges). Administrators can also use the hierarchical folder-creation and aliasing features to group frequently used devices from multiple zones into a single folder for users.

Administrators will appreciate the straightforward installation process (using the standard Apple installer, from an administrator-created disk or an AppleShare server) and the comprehensive administrator's manual, which includes step-by-step instructions, configuration tips, and examples. There's a one-page Quick Reference card for users as well.

If you long for the ability to simplify network access, either for yourself or for the users you support, try Silver Cloud.

AG Group, 2540 Camino Diablo, Suite 202, Walnut Creek, CA 94596; 510-937-7900. Version 1.0. \$495 for 25 users, \$895 for 50, \$1,595 for 100, \$3,095 for 250.

— Mark Bieler



Diamonds



Diamonds is a fast-paced arcade-style action game that's easy to learn but hard to master. The premise is simple: Using arrow keys, you control a colored — or, on black-and-white Macs, a patterned — ball on a playing field comprising different types of blocks. The object is to clear all the colored blocks and then all the diamond-shaped blocks from the field, on each of many levels. To clear a block, you touch it with the ball when the ball's color matches the block's. To change the ball's color, you touch a paintbrush block. However, you must be careful not to touch any blocks marked with ominous black skulls; if you do, you forfeit the ball in play — you get only six balls per game. Once you've cleared all the colored blocks, you can clear the diamond-shaped blocks, regardless of ball color, to complete the level.

This sounds simple, but trust us, it's not. There's no paintbrush for changing the ball back to its starting color, so if you don't clear all the blocks of that color before the ball touches a paintbrush, you're out of luck. Also, once you've mastered the first few levels, you encounter some confounding new blocks, the worst of

which are *reversers* — they make arrow keys do the opposite of what you expect. In all, there are 30 levels to challenge you, and if you master them, you can create new ones with the program's level editor.

Diamonds works fine in monochrome — we've spent hours playing it on our PowerBooks — but it's really much more engaging on a color Mac. Overall, we think it's one of the most addictive games since CrystalQuest.

Varcon Systems, Inc., 10509 San Diego Mission Road, Suite K, San Diego, CA 92108; 619-563-6700. Version 2.0. \$49.95.

— Bob LeVitus



Personal RecordKeeper



Hurricanes, earthquakes, tornadoes — we've seen more than our share of disasters lately — disasters that have left thousands of folks trying to find insurance policies and wishing they had a list of their possessions. If you'd rather be prepared than sorry, you'll appreciate Personal RecordKeeper (formerly For the Record), which gathers the scattered details of your legal, financial, and personal life into a single database you can copy and store in a safety vault out of disaster's reach.

Personal RecordKeeper's 200 categories cover finances, possessions, business interests, insurance, medical information, personal documents, family history, and estate details. There's even a Memorabilia category, so the obsessively organized can catalog every keepsake and love letter. And entering data in any category is a snap: Just select a subcategory, and fill in the requested information. Overall, the program asks the right questions, ranging from the location of stock certificates to child-care instructions. It does have surprising omissions, however. For example, there's no specific place to record driver's-license information or the serial numbers of electronic gadgets.

Much of the program is devoted to creating a comprehensive list of your belongings. Once this home inventory is complete, you can sort items by location or insurance policy, total their value to see if your insurance coverage is adequate, and print detailed reports that will warm

the heart of any insurance agent. Personal RecordKeeper can also calculate your net worth and create a list of your assets and liabilities. You can export the net-worth and home-inventory data in a special format readable by Intuit's Quicken personal-finance program or savable as a text file. (Alas, you can't import tab- or comma-delimited data from other sources.) To help you protect such data from prying eyes, Personal RecordKeeper lets you lock selected categories (or all of them) with a password. Unfortunately, although the password is encrypted, the data is not — which leaves it accessible to someone with a file-reading utility.

Although Personal RecordKeeper has some minor limitations — such as lack of data encryption, and cross-reference buttons that don't lead you to the related information — it's still an excellent (and economical) choice for organizing the myriad details of your life, and it can prove invaluable if you're the hapless victim of a fire or robbery. In true Nolo Press style, the 280-page manual includes a detailed guide to record keeping, financial affairs, and estate planning. For those who need to organize the paperwork for a school, business, or nonprofit organization, Nolo also offers a commercial license for Personal RecordKeeper.

Nolo Press, 950 Parker Street, Berkeley, CA 94710; 800-992-6656 or 510-549-1976. Version 3.0. \$49.95.

— Aileen Abernathy



Kid Pix Companion



A wildly successful painting program such as Kid Pix is a hard act to follow, but Brøderbund isn't trying to be a follower. Instead, it's introduced Kid Pix Companion, an add-on program that gives Kid Pix 19 new hidden pictures, 112 new rubber stamps, and four completely new features — including presentation and QuickTime-movie-editing tools.

Kid Pix Companion is a four-disk set with its own installer, which adds a new Companion menu to Kid Pix. The new features it provides are ColorMe, DrawMe, WackyTV, and SlideShow (a separate application).

ColorMe is essentially a page in an on-screen coloring book, and a DrawMe is a truly bizarre, randomly generated phrase ("I'm a troubled tarantula with a bright

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and bumpy hide, and I hate mayonnaise!") that the program dares the artist to draw.

WackyTV may be one of the most innovative commercial uses of QuickTime yet. Clicking on the WackyTV icon lets you select a QuickTime movie or one of 20 QuickPix movies, best described as animated rubber-stamp pictures. Tools similar to Kid Pix's wacky brushes provide ways to alter the images, and VCR-like controls make it easy to play a movie after you've pasted it into a drawing (only one movie is allowed per drawing).

SlideShow is also astonishing; it's like a version of MacroMind Director for kids. As many as 99 pictures — either Kid Pix drawings (with or without movies) or PICTs — can be pasted into the application. You choose how long a picture is displayed, what kind of sound effect is to accompany it, and what kind of transition effects are to be used between pictures. You can also easily add narration if your Mac has a built-in microphone or you have a Macromedia MacRecorder.

Two minor complaints: When you

reopen the program, it forgets how it was left the last time it was used, and the installation instructions don't mention that for best results, you should start with a freshly installed version of Kid Pix.

Brøderbund Software, 500 Redwood Blvd., P.O. Box 6121, Novato, CA 94948; 800-521-6263 or 415-382-4400. Version 1.0. \$39.95.

— Ken Gruberman



Magnet

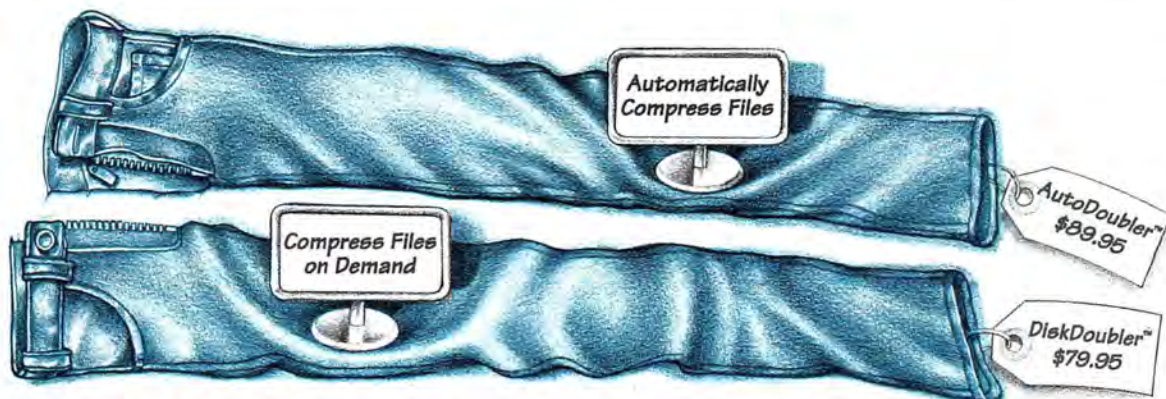
↑↑↑ 1/2

If you'd like to automate repetitive file-related tasks but don't think you're enough of a power user to do so, think again. Magnet, from No Hands Software, gives users a clean and easy interface to a subset of the Apple events built in to Finder 7.0 and later — primarily the events concerned with finding, moving, copying, and aliasing. These tools were formerly available only to power users with scripting programs such as UserLand's Frontier,

but Magnet doesn't require scripting. Instead, it lets you use buttons and menu selections to create files (called *magnets*) that perform sophisticated finds, timed backups, batch aliasing, and file synchronization between two computers.

Creating a magnet generally involves specifying three things: the criteria you want the magnet to use in finding files, the action you want it to perform on the files (moving, copying, or aliasing the files to a specific folder), and the moment when you want it to perform the action (triggering it by time/date, periods of idleness, or the mounting of a particular disk). Bear in mind that you must have Magnet running when the trigger condition occurs in order for the action to be performed at that time; some users may find this a drawback.

Magnet's find capabilities are similar to those of the Finder but not identical. Like the Finder, Magnet allows searches by name, size, label, created date, modified date, location, and kind. Unlike the Finder, Magnet doesn't allow searches by



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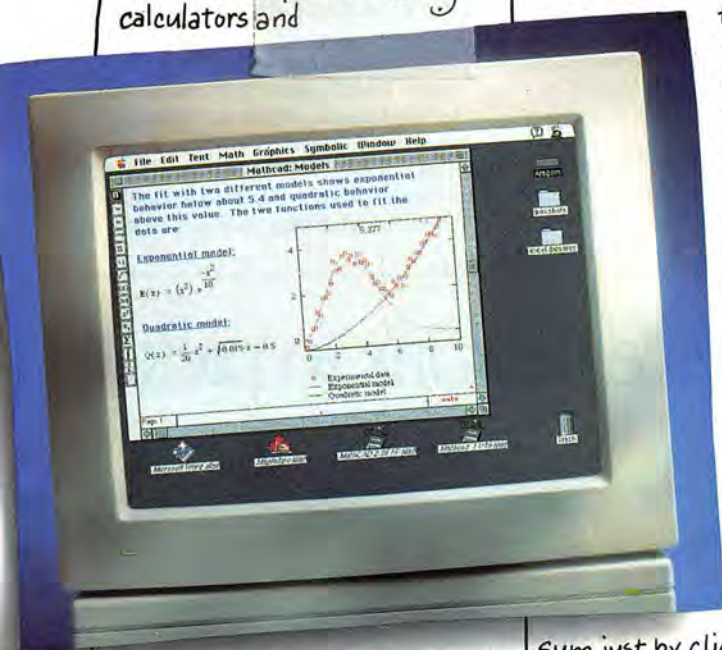
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version, finder comments, lock status, or exclusionary conditions ("is not" or "does not contain") — so there's no easy way to exclude, say, the System Folder from the locations you search. However, Magnet does allow searches by content — for example, you can search for all MacWrite documents containing the word *anorexia* — which the Finder doesn't allow.

In addition to setting up magnets that find files and do moving, copying, and aliasing, you can set up a special magnet to perform file synchronization — an attractive option for PowerBook users who tend to lose track of which file on which computer is the most current. The interface to this option makes it very easy to specify two folders that contain files you want compared and updated (No Hands also sells this capability separately in its new Synchro product). Magnet's file synchronization also works well with ARA (AppleTalk Remote Access) for automatic remote dial-up and synchronization.

With its concise, well-illustrated manual and friendly (if not toll-free) phone support,

No Hands makes power-user tricks easier for users of System 7.0 and above to come by. High-powered Mac scripters may not need it, but for anyone not in the propeller-head crowd, Magnet holds a definite attraction.

No Hands Software, Inc., 200 Page Mill Road, Suite 260, Palo Alto, CA 94306; 415-321-7340. Version 1.0. \$129.99.

— Tom Petaccia



Drive7



Hard Disk Toolkit Personal Edition



Whoever said the best things in life are free probably wasn't referring to the formatting and partitioning software that

comes with your hard drive. Once you've had such freebie software crash and burn in the presence of System 7, a PowerBook's Sleep mode, removable media, or a SyQuest drive, you'll understand why third-party formatting software such as Casa Blanca Works' Drive7 and FWB's Hard Disk Toolkit Personal Edition is selling like gangbusters.

If all you want to do is get your disk formatted and then get on with your life, either of the two is fine. Each formatted a 105-megabyte hard disk and a 128-megabyte optical cartridge in about the same amount of time, and the read/write times for the resulting volumes were also nearly identical in our informal benchmark tests. The two packages are very different in other ways, however.

The most obvious difference is the interface. Drive7 sports a friendlier, simpler interface than Personal Edition does, forsaking the menu bar entirely in favor of big, inviting buttons. Personal Edition looks more like a traditional Mac application and is reasonably straightforward, if

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a bit modal; at times it seems as if you'll be stuck dismissing an endless series of warning alerts.

Personal Edition might not be pretty, but it does inherit some nifty features from FWB's superdeluxe Hard Disk Toolkit (\$199.95; Personal Edition owners can upgrade for \$99). Unlike Drive7, Personal Edition lets you add and modify partitions without reformatting the whole drive. It also sports a better collection of tools for gathering data about your drive and your Mac, and its manual is exceptionally clear, with a thorough troubleshooting chapter. One potential trouble spot, though, is Personal Edition's boot disk: Although Drive7 includes both System 7 and System 6 "panic" disks (so you can boot off a floppy containing system software and your formatting utility if your sole internal drive crashes), Personal Edition includes only a System 6 boot disk, which can't be used with some of the newer Macs.

The most glaring difference between these two packages, though, is in their

control panels—Drive7's is significantly more useful. Personal Edition comes with HDT Prober and HDT Extension: The former is a control panel that can scan the SCSI bus and mount devices—essentially the same functions that the freeware control panel SCSIProbe performs (although HDT Prober gives you greatly expanded information on mounted devices); the latter lets you use a removable drive without requiring a cartridge in the drive at startup. Drive7's control panel, Drive7rem, has all of HDT Prober's basic features, *plus* it can mount individual partitions and change attributes and passwords; it also offers some extra support for removable cartridges.

It used to be that you didn't have to think much about hard-disk formatting software, but times have certainly changed. For us, the Drive7rem control panel tips the scales in favor of Drive7. Without it, a buying decision boils down to a choice between Drive7's clean interface and Personal Edition's upgrade option and clear manual. With Drive7rem in the picture,

Personal Edition looks much less attractive. For fast and easy formatting, choose Drive7; for great formatting and diagnostics, you're better off paying the extra bucks for the full-blown Hard Disk Toolkit.

Drive7, Casa Blanca Works, Inc., 148 Bon Air Center, Greenbrae, CA 94904; 415-461-2227. Version 2.3. \$79.95.

Hard Disk Toolkit Personal Edition, FWB Software, 2040 Polk Street, Suite 215, San Francisco, CA 94109; 415-474-8055. Version 1.1.2. \$79.

— Andy Ihnatko



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format Macintosh disks. While they're hemming and hawing, show them what your Mac's SuperDrive can do with an inexpensive software add-on such as Apple's recently introduced Macintosh PC Exchange or the more versatile, recently upgraded AccessPC, from Insignia Solutions.

AccessPC and Macintosh PC Exchange each load at startup and work similarly. Without them, your Mac can't recognize any PC disk from the Finder (although it can from within the cumbersome Apple File Exchange utility); it asks if you want to format the disk. With either AccessPC or Macintosh PC Exchange installed, you instead see a PC-disk icon appear on the desktop, ready for you to access its files as if it were a Macintosh disk. Insert an unformatted disk, and select among Macintosh and DOS formatting options. (The one caveat, worth mentioning again, is that your floppy drive must be a SuperDrive.)

AccessPC and Macintosh PC Exchange each enable you to map particular DOS

extensions to appropriate Mac applications — for example, you can instruct either program from its control panel to automatically launch Microsoft Word when you double-click on a PC file with a TXT extension. (If you can't find a format your DOS as well as your Mac applications can handle, of course, you'll need to use a translation package such as DataViz's MacLinkPlus/Translators.) Both programs also adjust adequately for the PC's more restrictive naming conventions, and both handle files generated under DOS or Windows.

Both of these largely install-and-forget utilities are equally able to perform basic functions. AccessPC, however, offers some specialized capabilities not found in Macintosh PC Exchange. Most significantly, AccessPC also works with many external and removable drives, and this upgrade adds compatibility for some additional models (mostly optical and 5.25-inch). Users of Insignia's IBM-compatible emulation software (SoftPC, SoftAT) will appreciate an added convenience: You

can mount files that were created within the emulation environment on the Mac desktop, so you can use the files with Mac applications. AccessPC is also more flexible in its operating-system requirements: It runs on System 6.0.5 or later; PC Exchange requires System 7.

Veteran PC-to-Mac-and-back file sharers know that Dayna Communications' DOS Mounter also does an admirable job of adding PC disk-handling capabilities to the Mac's SuperDrive. The upgrade of AccessPC and release of Macintosh PC Exchange fosters healthy competition in this narrow field, which promises to grow as more and more Macs coexist with PCs.

AccessPC, Insignia Solutions, Inc., 526 Clyde Avenue, Mountain View, CA 94043; 800-848-7677. Version 2.0f6. \$99.95.

Macintosh PC Exchange, Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; 800-776-2333 or 408-996-1010. Version 1.0.1. \$79.

— Shelley Cryan

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Making Connections

*Telecommunications software should be as easy to use
as your phone — but it rarely is.*

BY TOM PETACCIA

Starving at a banquet. That's how most users feel when they're confronted with telecommunications software for the first time. You just know there's a huge smorgasbord of information and like-minded users out there, but you haven't a clue how to reach them.

We took a look at five Mac telecommunications packages: Freesoft's White Knight, Software Ventures' MicroPhone II, Hayes' Smartcom II for the Macintosh, Alverson Software's ZTerm, and Mercury Systems' MacIntercomm. Each has something to recommend it, but unfortunately, the converse is true too.

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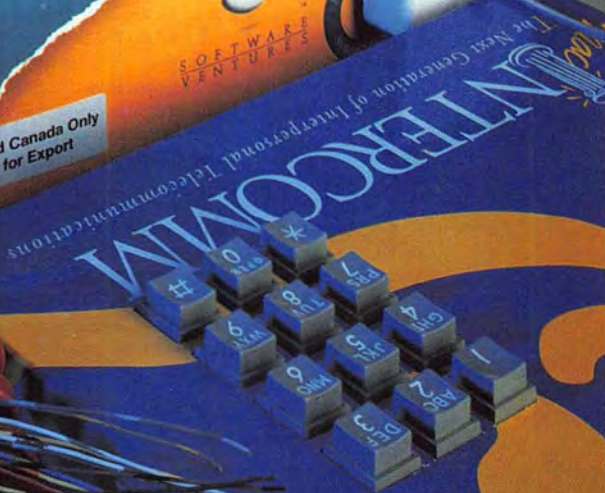
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Telecommunications Programs

White Knight: Rusty Armor

Red Ryder, Scott Watson's shareware product, was the first full-powered telecom package for the Mac. The program, which still boasts a vast legion of enthusiastic users, went commercial a few years ago and was renamed White Knight. But the years haven't been kind, and this knight's armor is definitely tarnished.

White Knight offers a long list of powerful features that can be intimidating to those new to telecom. To create a settings file, for example, you have to traverse a maze of hierarchical menus (see Figure 1), but because you can save settings files, you can build custom settings for different log-ins or other uses.

White Knight's strength is its extensive scripting language. Scripts are a series of instructions that automate several telecommunications tasks. With White Knight, adept scripters can create sophisticated *procedures* (as they are called in White Knight), complete with dialog boxes and other goodies. White Knight's scripting is powerful, but creating a procedure from scratch is probably beyond first-time users.

Fortunately, White Knight has a Write for Me option, which records your actions and creates procedures for you — however, we found that most scripts created this way required at least a little tweaking before they executed correctly.

Written procedures are plain-text files that can be created with any text editor or word processor, but they have to be compiled to run, forcing you to keep the text version

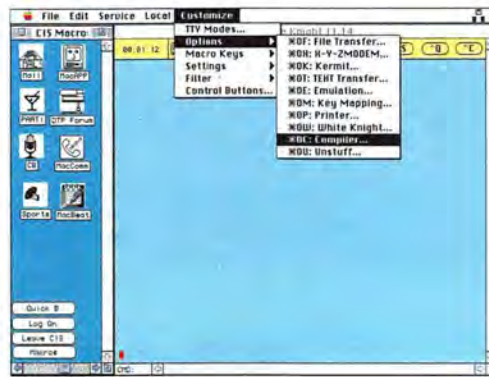


Figure 1: White Knight is best suited for experienced telecom users. Creating a session file requires navigating a series of hierarchical menus, which we found tiresome. Also, note the double-letter Command-key equivalents.

handy in case you ever need to make ad hoc modifications.

White Knight also includes a special RCMD module that helps with creating and editing scripts. RCMDs are specially written external commands (much like XCMDs in HyperCard) that let programmers add functions to White Knight.

In addition to letting you create procedures, White Knight allows you to create as many as 30 macro buttons, which can either execute a procedure or enter a simple text string (for example, logoff). For added visual impact, you can assign a black-and-white

icon or a small PICT image to a button.

You can also create any number of *filters*, which can process incoming or outgoing text and filter out certain ASCII characters (such as line feeds) or convert them into other characters. Most users won't need to create any specialized filters, but for universities or for those accessing special systems such as in-house mainframes, this feature is a major plus.

The program supports the TTY, VT52, VT100, and VT102 emulations with full ANSI color support. It also incorporates the Xmodem, Ymodem, Zmodem, and Kermit (including Sliding Windows Kermit) file-transfer protocols. Support for CompuServe's Quick B protocol is handled via an RCMD module that must be initiated separately.

White Knight is definitely showing signs of age. The interface is basically unchanged from its early shareware days, so the windows and dialog boxes look and feel

Telecom with the Works

Integrated-software packages such as ClarisWorks, Microsoft Works, Symantec's GreatWorks, and WordPerfect Works all have embedded telecommunications modules. They're all pretty much the same, which means they're all pretty much not worth using — except by the most casual of telecom users.

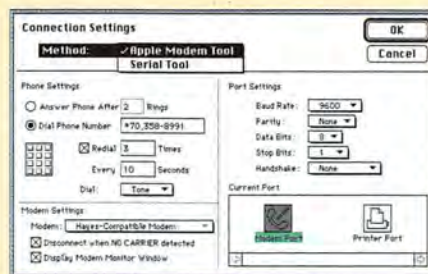
All the "Works" products use Apple's Communication Toolbox (see figure at right) in their telecom modules. The Communication Toolbox is an Apple system-software programming add-on that makes it easy for developers to add data connections, terminal emulations, and file-transfer protocols to any application.

At this point, the only terminal emulations the Communication Toolbox supports are TTY, VT100, and VT102; and Xmodem is the only file-transfer protocol currently available. Xmodem is the slowest of protocols, so if you use a commercial on-line service, it actually costs you more to use a Works telecom module than to

use a dedicated telecommunications program.

All the Works modules have a type of macro language for automating some tasks, but they are all extremely limited and are not always reliable.

Our advice: Use your Works package to download ZTerm from a local BBS, and see if that meets your needs.



All the Mac integrated (Works) packages use Apple's Communication Toolbox (shown here) to control data connections, terminal emulations, and file transfers, so none of them are especially powerful.

clunky — not nonfunctional, mind you, just awkward.

Procedures and macros are stored as separate files, the paths of which are “hard-coded” into procedure scripts and macro calls. If you move a folder or change the name of your hard drive, you’ll have a lot of retooling to do, because you’ll have to correct all the pathnames manually.

White Knight is System 7-compatible but not System 7-friendly. It can’t take advantage of advanced features such as publish-and-subscribe or Apple events.

The manual mirrors the program. It has a lot to offer, but the presentation is clunky and confusing. It does include Scott Watson’s unique brand of humor, however, which makes reading it a little more bearable.

As an extra, Freesoft throws in Okyto, a small telecom program that provides extremely fast file transfers among Okyto users. Okyto even lets you do a little one-on-one conferencing during transfers.

Tech support is available by phone, but only on weekdays from 1 to 5 p.m. EST, and it’s not toll-free. Most of the support is provided via the Freesoft RoundTable on GENie.

White Knight is a powerful, low-cost telecom program that’s best suited for power users and hackers. If you don’t mind being slightly visually offended and taking a few extra steps, it’s a good value, but telecom neophytes should look elsewhere.

MicroPhone II: Power Pick

Software Ventures sells the latest version of the MicroPhone II telecommunications package in three configurations: the original MicroPhone II package; MicroPhone Pro, which includes a Telnet tool for accessing special host computers, such as those on the Internet, plus the popular FAXstf fax-modem program; and the new MicroPhone Personal, which includes only a few of the terminal-emulation, file-transfer, and scripting options of MicroPhone II.

Compared with the visual cacophony of White Knight, MicroPhone II’s interface is peaceful simplicity — no hierarchical menus, just straightforward menus and easy-to-follow dialog boxes. Assigning preferences and other settings is much easier on the eyes — and the brain.

Using MicroPhone II consists of creating a session file, which contains related settings, phone numbers (services), and scripts. The package includes specially written session files for accessing popular communications

services, such as CompuServe (see Figure 2) and GENie, as well as some for in-house mainframe connectivity.

Because all settings and scripts are embedded in a session file, you don’t run into the hard-coded-paths problem of White Knight. You can assign scripts to be executed from the Scripts menu or from a button bar. As with White Knight, you can assign an icon to a script button, but MicroPhone II adds the luxury of color. MicroPhone II includes a nice selection of icons, and you can create your own, using ResEdit.

The Watch Me script-creation feature operates the same way as its White Knight counterpart, except with much greater reliability. You edit scripts and create them from scratch via the Script Manager, a kind of script-construction kit. The script editor lists all script commands, along with their correct variable options and syntax, which makes it easy to build scripts that work right away.

Advanced script writers can use a text editor to create scripts and import them into MicroPhone II. Scripts can also be exported from session files, and HyperCard XCMDs can be incorporated for added functionality. Because of the program’s smart use of color and its powerful scripting language, users can create very attractive front ends for host computer systems.

The program supports the TTY, VT52, VT320, VT102 ANSI, and IBM PC ANSI emulations. The transfer protocols supported are Xmodem, Ymodem, Zmodem, Kermit, and Quick B.

MicroPhone II is fully System 7-friendly, including support for publish-and-subscribe and Apple events. The Apple-event support means that you can control MicroPhone II operations with macro and scripting programs such as CE Software’s

QuicKeys and UserLand’s Frontier (a MicroPhone II Frontier Install file is available from the UserLand Forums on AppleLink and CompuServe) as well as other applications such as Claris’ FileMaker Pro 2.0.

MicroPhone II’s documentation consists of two manuals. The *User’s Guide* is a 192-page tutorial that does a nice job of explaining a myriad of telecommunication concepts as well as how to use the program. The 456-page *Reference Manual* explores in much greater detail the program’s features and explains all the scripting commands.

The company maintains its own BBS for technical support as well as a presence on the leading on-line services, including



Figure 2: MicroPhone II should appeal to advanced users and telecom developers who need powerful scripting, extensibility, or the ability to create custom interfaces. The package also includes a series of attractively designed front ends to major commercial telecommunication services, such as CompuServe.

Telecommunications Programs

CompuServe, Delphi, and GENie. Phone support is also available, but it's not toll-free.

If the program has any negatives, it's that it has a tendency to run a tad slow. We endured long pauses when starting and quitting, which were frustrating but nothing more. Also, MicroPhone II may be a bit too feature-heavy and unwieldy for many users. But if you want all the telecommunications power you can get, along with a slick interface, MicroPhone II is for you.

Smartcom II: The Right Choice

Hayes' Smartcom II doesn't do everything White Knight and MicroPhone II can do, but what it does do, it does extremely well.

Smartcom II is a straightforward product, easy to set up and extremely easy to use. Its look and feel can best be described as cute, making good use of color icons for its standard commands and dialog boxes.

Like MicroPhone II, Smartcom II creates a session file that contains its particular scripts, buttons, and settings. Unlike MicroPhone II, it lets you assign only one phone number per session file.

The scripting portion of Smartcom II is called Autopi-
lot. Like the two programs previously described in this article,

Smartcom II can write a script for you by recording your actions. We found this learning mode very reliable. Also like the other two, Smartcom II has a script editor, with which you can create and edit scripts. However, instead of having a straight command list, as the others do, Smartcom II breaks commands down into categories, which makes finding and entering the correct commands much faster.

Like White Knight's, Smartcom II's buttons can either enter a simple text string or execute a script (see Figure 3). However, the program has no option for including icons. Its scripting language does not have high-end abilities, such as being able to create dialog boxes or incorporate external commands (RCMDs or XCMDs). Although power users may wish it had these features, most everyday telecom users will never miss them.

A special extra in the program is the Canvas command, which lets two Smartcom II users share a drawing palette to do everything from playing tic-tac-toe to collaborating on a technical drawing.

The program supports the TTY, VT52, VT102, Prestel (ViewData Videotext), Minitel (French Videotext), and ANSI BBS emulations. The Xmodem, Ymodem, Zmodem, Kermit, and Quick B transfer protocols are supported.

The only real disappointment



Figure 3: Smartcom II's ease of use doesn't come at the expense of power. The program's clean interface includes color icons (left) for main commands (such as beginning/ending a session and printing) and a large button bar (bottom) for entering text strings and script execution.

Picture Phones

For Mac users who are accustomed to pull-down menus and icons, text-based BBSs and commercial on-line systems pose a real challenge. The answer is graphical telecom packages — software that gives Mac users a reasonably familiar interface with which to work.

Services such as America Online, AppleLink, and Prodigy use proprietary graphical software. CompuServe offers CIM (CompuServe Information Manager), a graphical software alternative (see figure at right) for those who don't want to use standard text-based software.

The advantage of going graphical is obvious. You can point, click, and pull-down your way through the electronic jungle with little chance of getting lost. Graphical interfaces definitely make using telecom a more pleasant and productive experience.

Unfortunately, these programs can be used only for their specific service — you can't use your America Online software to call the neighborhood BBS or AppleLink, for example — so you have to buy more software for your other telecom needs.

Also, graphical telecom software is similar to the Windows operating environment

on the PC — it's just a graphical shell on top of a text-based system. This taxes your computer's processor, so things have a tendency to run a bit slower than they would if your Mac were driving text-based software. In addition, the graphic shell structures operations a bit more, so you may not be able to use some text-based shortcuts.

For many users, however, the advantage of knowing exactly what they're doing without having to remember text commands or risking a typing mistake far outweighs the disadvantages.



CIM (CompuServe Information Manager) gives you a graphical interface to make accessing CompuServe much easier, but because it's a shell on top of a text-based host, using it is not as quick as working directly.

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with Smartcom II is that it supports only the four required System 7 Apple events: Open Application, Open Document, Print Document (nonfunctional, because settings files can't be printed), and Quit Application. If Hayes had added a simple DoScript Apple event, which would extend Smartcom II's power considerably, we might have given the program a perfect rating.

The manual is well organized and easy to follow and has an excellent index and table of contents. The program also includes good on-line help. For tech support, Hayes offers direct phone support and has its own forum on CompuServe and several other on-line services.

Smartcom II proves that a product doesn't have to have every bell and whistle to be the best in its field.

ZTerm: Shareware Simplicity

ZTerm, one of the first Mac telecom programs to support Zmodem file transfers (hence its name), has taken over the title of Top Mac Shareware Telecom Program, since White Knight (née Red Ryder) went commercial. Author Dave Alverson has created a telecommunications program that, although not long on features, does a solid job.

ZTerm stores all of its service numbers in one file; it has no separate session files. However, the Service Connection dialog box for each service has entries for the account name/number and password, so your log-on scripts can access them automatically.

All modem, terminal, transfer, and other settings and preferences are entered via 11 separate menu-activated dialog boxes. A consolidated approach would make the process more palatable.

ZTerm sports a nice, simple scripting language that's useful only for the simplest of telecom scripts. The commands are limited to wait, wait-for, send, open-capture (incoming text to a file), close-capture, display (text string on-screen), beep, and hang-up instructions. You can also throw in some predefined variable calls, such as the aforementioned account and password items in the Service Connection dialog box.

You type scripts externally with a text editor or word processor (you must save them as text) and access them externally via a menu command or by assigning each one to one of ZTerm's ten text-string macros (the ® character is used to signal the execution of a macro).

The program supports only VT100 and PC ANSI emulations, but these are usually enough to get any Mac user into most standard systems. The Xmodem, Ymodem, Zmodem, and Quick B transfer protocols are supported.

ZTerm's biggest drawback is that its scripting language is so basic. If you want to create scripts that do anything more complex than wait-and-send actions, you'll need to look at one of the other programs reviewed here. Also, because the scripts are stored externally, you can run into a problem if a script is moved or accidentally deleted. And because all of your phone numbers are stored in one file,

A Glossary of Telecommunications Terms

BBS: bulletin-board system. A host computer running bulletin-board software that allows users to call in, read and post messages, and transfer files.

file-transfer protocols: The method by which files are transferred (uploaded or downloaded) to or from a host. Usually refers to error-correcting binary protocols that check for problems during a transfer and that resend any data if a problem occurs. Binary transfers contrast with ASCII (straight text) transfers, which are used only for transferring plain-text files. Common binary protocols include the following (in *bold italic*):

Quick B: A special protocol used only on CIS (CompuServe Information Service); using it is the best way to upload and download files on this service.

Kermit: Yes, as in the frog. Used primarily by educational institutions and older mainframes. The slowest of all the protocols; don't use it unless you absolutely have to.

Xmodem: The most common error-checking protocol. Just about every place you call will give you this option at least.

Ymodem: Faster than Xmodem. Allows you to upload and download more than one file at a time (do batch transfers).

Zmodem: The fastest of the protocols. Also allows batch transfers plus the option of resuming a transfer if a connection is broken for any reason. Your No. 1 choice if you have the option.

(Special note: You may see the term *MacBinary* in connection with protocols. This is not a protocol in and of itself [although some telecom programs mistakenly label it as such]. It is an option that allows a binary file transfer to include the

special header information that the Mac needs to determine that the document is a Mac file [file type, creator, icon info, and so on]. Always have MacBinary enabled. The only time you should turn it off is if you are sending a file for use on a non-Mac computer.)

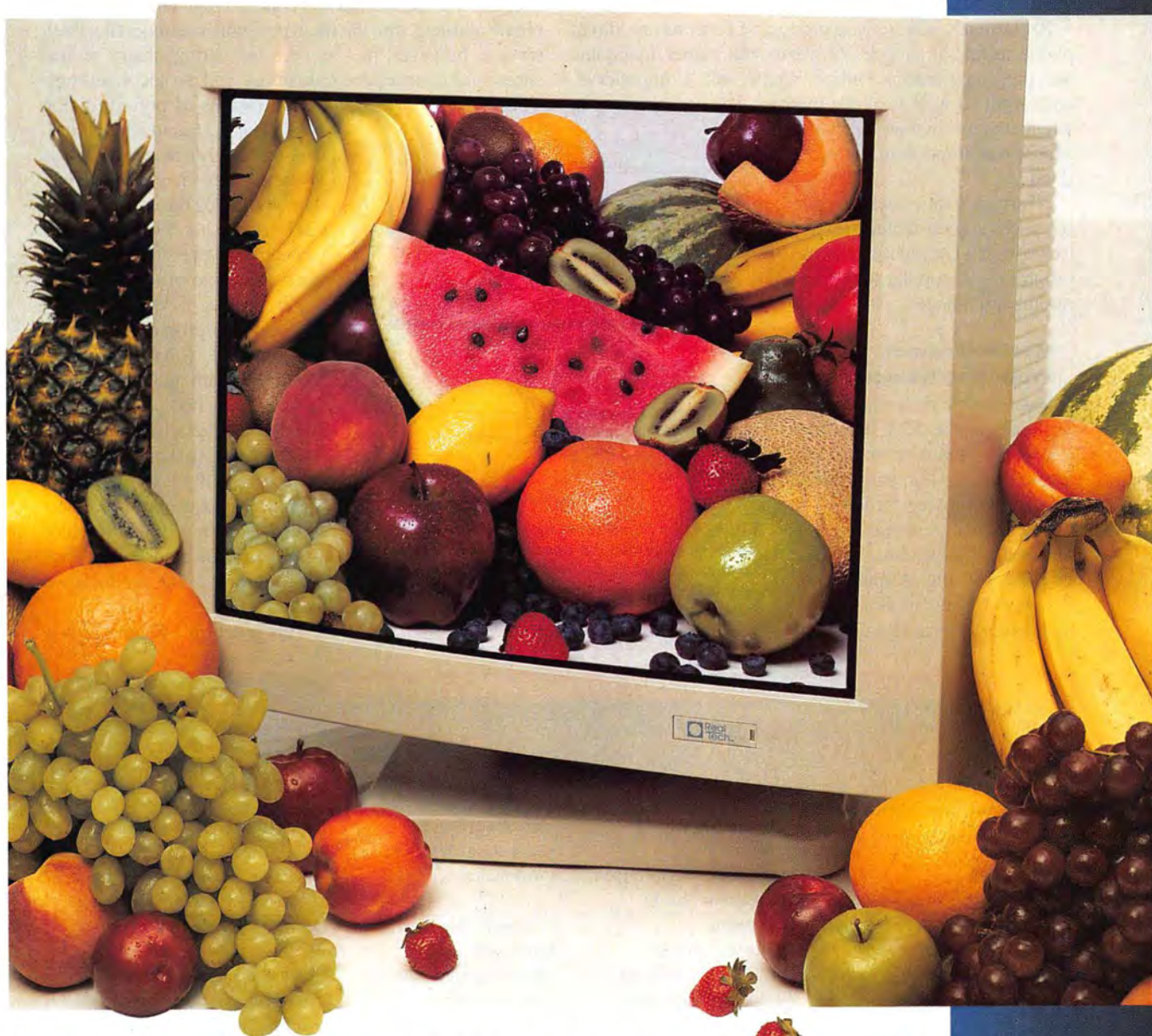
host computer: The computer your computer is connecting to. This can be another personal computer or a mainframe. The host computer calls the shots. It dictates what settings your telecom software must have in order to have a successful connection.

leading on-line services: Refers to commercial information services that charge either a flat fee or an hourly usage fee. Examples of text-based services (those that can be accessed with the software mentioned in this story) are BIX, CompuServe, Delphi, GENie, and ZiffNet. Other services such as America Online, AppleLink, and Prodigy require their own specialized graphical software.

terminal emulation: Refers to the ability of a telecom package to *emulate* the terminal type the host requires — for example, a Digital VT100 or VT220 terminal. Many host systems require a specific emulation to have a successful connection. Others give you an option (for example, TTY, VT100, or PC ANSI). The advantage of using the recommended emulation for a host computer is that you can take full advantage of the features the particular emulation offers. These can range from full-color on-screen graphics to special cursor and text-editing options. Check what your emulation setting should be before you connect. If you aren't sure, try TTY or VT100.

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ZTerm's limit of only ten text-string macros is too restrictive. But considering the price, ZTerm still packs a lot of value for the telecom dollar.

Because it's a shareware product, ZTerm has no direct phone technical support; however, the author maintains accounts on America Online, AppleLink, CompuServe, and GENie as well as on the Internet. The documentation, which comes in the form of a MacWrite document, is quite good.

ZTerm is a nice package, giving users a good feature set at a low cost. It's easy to see why this program is so popular with many on-line aficionados.

MacIntercomm: Promising Newcomer

MacIntercomm, from Mercury Systems, is the first new Mac telecom program in years. Unfortunately, the company should have waited a wee bit longer to release it. MacIntercomm 1.0 was released as "Expoware," shipped in time for the August 1992 Macworld Expo in Boston. Although the program boasts many

innovative features, it's missing a key element.

Unlike MicroPhone II and Smartcom II, MacIntercomm does not use the session-file concept. You enter all service phone numbers into the main program's settings file. Each service, however, has its own text-string macro preferences and connection, emulation, and protocol settings. You set these preferences via a series of pop-up dialog

boxes that we found a little cumbersome but not nearly as bad as White Knight's hierarchical hell. Also, the dialog boxes themselves can be confusing. You really need to keep one eye on the manual the first couple of times you set preferences.




One of the program's innovative features, Smart Dial, lets MacIntercomm dial or not dial a service's area code, based on the location you are calling from. The program's AutoDial feature can call a subset of your services in a predefined sequence. MacIntercomm also has the best color ANSI implementation (see Figure 4) of any of the products we looked at.

This program's biggest plus is



Figure 4: MacIntercomm looks promising. It currently provides the best ANSI-emulation color support, but the first version lacks a scripting language. When the new version — with scripting — ships, it may give MicroPhone II some serious competition.

Table 1: Pros and Cons of Telecommunications Programs

	 Pros	 Cons	 Ideal Users
MacIntercomm 1.0	<ul style="list-style-type: none"> • Preemptive background file transfers. • Outstanding color ANSI support. • Many exclusive features. 	<ul style="list-style-type: none"> • No scripting language. • Some dialog boxes confusing. • Weak manual. 	<ul style="list-style-type: none"> • Intermediate and advanced users who call ANSI BBSs. • Users who want innovative features and don't need a scripting language.
MicroPhone II 4.0.2	<ul style="list-style-type: none"> • Very powerful. • Clean, attractive design. • Full support for publish-and-subscribe and Apple events. 	<ul style="list-style-type: none"> • Expensive in some configurations. • Runs a little slowly. • May be too sophisticated for beginning users. 	<ul style="list-style-type: none"> • Intermediate and advanced users who want advanced scripting and full Apple-event support. • In-house programmers who need to create custom front ends.
Smartcom II for the Macintosh 3.4	<ul style="list-style-type: none"> • Easy to set up and use. • Scripts easy to create and edit. • On-line help available. 	<ul style="list-style-type: none"> • Scripting not as powerful as MicroPhone II's or White Knight's. • Doesn't support the DoScript Apple event. 	<ul style="list-style-type: none"> • Beginning to advanced users who don't need high-end features but still want good scripting and maximum value.
White Knight 11.14	<ul style="list-style-type: none"> • Very powerful. • Excellent and flexible scripting language. • Low cost. 	<ul style="list-style-type: none"> • Unappealing interface. • Procedures, macros, and settings stored externally. • No color icons for buttons. 	<ul style="list-style-type: none"> • Intermediate and advanced users who want advanced scripting at the lowest possible cost. • Users with special host requirements.
ZTerm 0.90	<ul style="list-style-type: none"> • Very low shareware fee. • Simple but functional set of communications tools. 	<ul style="list-style-type: none"> • Scripting language limited. • Too many settings and preferences dialog boxes. 	<ul style="list-style-type: none"> • Beginning and occasional telecom users with basic needs and limited budgets.

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Telecommunications Programs

that the Mercury programmers have done a whale of a job in facilitating background file transfers. Enabling preemptive multitasking lets you upload or download files in the background without the danger of an aborted transfer or any significant slowdown in whatever you are doing in the foreground. You can even format a floppy disk while doing a transfer, without any loss.

What MacIntercomm doesn't have is a scripting language. And there's the rub. In the rush to get this program out last August, Mercury decided to leave out the scripting language, promising to send it free to buyers within 30 days. As you may have guessed, three months later (at press time), the language still hadn't shipped, so the program's overall functionality is severely crippled.

MacIntercomm supports the TTY, VT52, VT102, VT220, and PC ANSI emulations. The transfer protocols supported are Xmodem, Ymodem, Zmodem, and Kermit. Version 1.0 does not support the Quick B protocol, although version 1.1 reportedly will.

The 140-page manual is fair. The first 80 pages discuss the program's operation and can sometimes be a little too terse for beginners. The remainder of the manual details the commands in the currently nonexistent scripting language. The index isn't complete, and looking things up can be a challenge.

Phone technical support, however, is enthusiastic, knowledgeable, and friendly. At press time, the company did not have an official presence on any on-line service, although one of the program's authors, Frank Price, is familiar to users on many services and can be reached on America Online, AppleLink, CompuServe, and GENie.

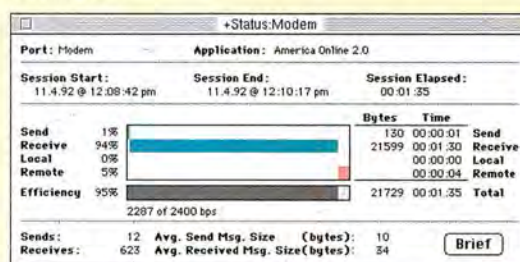
This is a program with a lot of potential. MacIntercomm's feature set and implementation are genuinely exciting, but the omission of a scripting language was a major mistake. Once version 1.1 ships, our rating of this product may take a dramatic jump.

Good Connections

Depending on your needs and level of telecom expertise, you really have only two programs to choose from. Smartcom II is simple and powerful enough for the majority of Mac telecom users. For those whose activity is

Telecom Tool

No matter which one of these telecommunications programs you settle on, there is a way to monitor your telecommunications performance. *MacUser's* exclusive utility *Serial of Champions* monitors your modem as you work on-line, providing useful statistics in an easy-to-read format. *Serial of Champions* shows you the overall efficiency of your on-line sessions, based on your modem's maximum possible transmission speed. For instance, compare various file-transfer protocols, such as Xmodem or Zmodem, to find the most efficient one. In a recent update, *Serial of Champions* now supports more telecommunications applications and on-line services. Version 1.0.1 adds support for AppleTalk Remote Access, America Online, and First Class, and modem speeds higher than 9,600 bps. *Serial of Champions* is available in the ZiffNet/Mac MacUser Forum (GO MACUSER) in Library 3 (MacUser Utilities); the filename is SERIAL.CPT.



Serial of Champions, downloadable from ZiffNet/Mac, has bar graphs that show the percentage of time your Mac spends sending and receiving data as well as the amount of time your Mac and the remote machine need to process the data.

limited primarily to direct connections with other users and logging on to on-line services, Smartcom will be more than enough. If you want or need more-high-powered features, such as buttons, extensibility through XCMDs, and custom interfaces, look to MicroPhone II. If MacIntercomm's scripting language delivers all that's been promised, however, it could offer some serious competition. Ⓜ

Tom Petaccia is a Mac consultant based in Charlotte, North Carolina. He is also a sysop for ZiffNet/Mac's MacUser Forum.

Table 2: Telecommunications Programs

	MacIntercomm 1.0	MicroPhone II 4.0.2	Smartcom II for the Macintosh 3.4	White Knight 11.14	ZTerm 0.90
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Quote from MacUser September 1992 issue, "Personal PostScript Printers" by Bruce Fraser.

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Timely Reminders

Haven't had a chance to pick a personal-scheduling program?

*We made an appointment with 16 programs to find out
which one will keep you on time.*

for most people, organizing their schedule is like getting their teeth cleaned. They don't really want to bother, but they know that if they neglect it long enough, they'll be sorry. Happily, computers are ideally suited for managing today's overbooked and too-busy life-styles. By adopting one of the many programs covered in this review, you'll discover how keeping track of your schedule can be at least relatively painless, if not downright (dare we say it?) fun.

Computer-based personal schedulers all share some advantages. Find commands, alarms, and automatic scheduling of recurring events are all features that traditional printed calendars can't begin to match. As we went comparison-shopping, we focused on three general areas all these computer schedulers have in common.

First, they raise an alarm whenever the time comes for a scheduled event. The alarm is actually a dialog box that contains the title text of the reminder, usually accompanied by a brief sound. This dialog box may give you several options

BY TED LANDAU

PHOTOGRAPHY: ROSEMARY WILTON



S	M	T	W	T	F	S
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8	9	16	23			
14	15	22				
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Scheduling Software

besides letting you simply acknowledge the reminder, such as a “snooze alarm” that sends the reminder away for some user-specified interval. There’s no limit to the number of alarms you can have set at one time, and they appear no matter what program you’re using when they come due.

Other alarm-related features typically found in these programs include advance warnings (so you aren’t reminded of a meeting across town when you should already be there) and automatic scheduling of recurring events (such as meetings on every second Thursday of each month).

Second, these programs act as on-screen calendar displays and appointment schedulers. Typically, you can switch among daily, weekly, monthly, and even yearly views — or a chronological list of your appointments. With most programs, you can also maintain a to-do list of unscheduled events that are carried forward each day until you mark them as completed.

Third, because you won’t always be in front of your Mac when an appointment comes due, these programs can print out your schedule, usually in your choice of calendar and appointment-book formats.

Although several of these programs permit sharing of

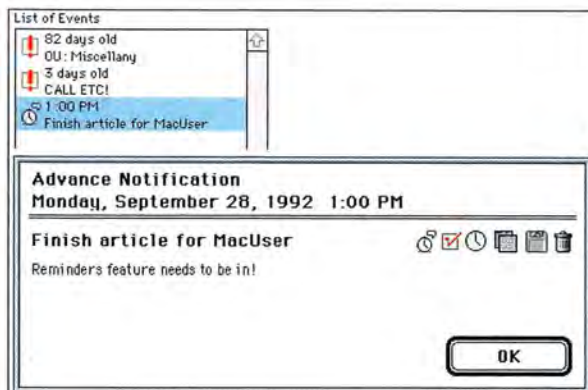


Figure 1: No program offers as many options for reminders as Alarming Events. This Advance Notification window, for instance, lets you directly delete or archive items.

calendars across a network, we focus only on single-user scheduling for this review.

What to Look For

Two programs may seem to have the same feature, such as recurring-event settings, yet they actually may be quite

Secondary Reminders

There’s certainly no shortage of choices in reminder and scheduling software. Here’s a roundup of five additional programs, with a brief explanation of why each one didn’t make our final cut.

With *The Far Side Computer Calendar*, the first of a series of cartoon calendar programs from Amaze!, a different *Far Side* cartoon appears for each day of the year. Although this may be great for Gary Larson fans, those who are more interested in the serious use of the program are likely to feel shortchanged. For example, in the current version, the alarm function works only if the program is open, the reminder window doesn’t even have a snooze alarm, and there’s no advance-warning capability. Version 2.0, due out by the time you read this, remedies many of these problems. Some of version 2.0’s features, such as its enhanced recurring-event settings, are outstanding, but the program still pays more attention to being cute than to having a truly functional design.

In *Active Memory*, from ASD Software, reminders are designed primarily to be sent to people other than yourself. The program

sends messages over a network to user-assigned receivers at user-designated times. Although it is potentially useful for coordinating project deadlines, *Active Memory* is outside the single-user focus of this article.

Smart Alarms, from JAM Software, is useful only as a simple way to set reminders. Limited to a single chronological list of timed events, the program provides no to-do list and no way to filter the chronological list based on selection criteria (such as date or category). A separate utility, *Appointment Diaries*, provides more-calendar-oriented displays. But entries made in one utility are not automatically transferred to the other.

CalenDAr, from Psybron Systems, doesn’t have enough horsepower to compete effectively, despite its attractively simple interface. Among other shortcomings, reminder text is not visible in the program’s monthly view, you cannot adjust the snooze-alarm time from the reminder window, and there is no printing capability.

Finally, avoid *Rendezvous Plus*, from PMC Telesystems. Just

	Active Memory	CalenDAr	The Far Side Computer Calendar	Rendezvous Plus	Smart Alarms
	⚡⚡	⚡⚡	⚡⚡⚡	⚡	⚡⚡
List price	\$199	\$60	\$69.95	\$249	\$90
Company	ASD Software 4650 Arrow Hwy. Ste. E6 Montclair, CA 91763 714-624-2594	Psybron Systems 1116 Smith St. Ste. 206 Charleston, WV 25301 304-340-4260	Amaze! 11810 115th Ave. N.E. Kirkland, WA 98034 206-820-7007	PMC Telesystems P.O. Box 5127 Vancouver, BC V6B4A9 Canada 604-255-9949	JAM Software 843 W. Main St. Meriden, CT 06450 203-630-0055

different in what they can do. For example, when looking at a recurring-event option, we tested how well it could handle more-unusual settings, such as one for the last Thursday of every other month. Could we optionally decide whether a change to (or deletion of) one occurrence of an event automatically affected all other linked occurrences or just that single event? Did the program display only the next instance of a recurring event, or could it display all future occurrences?

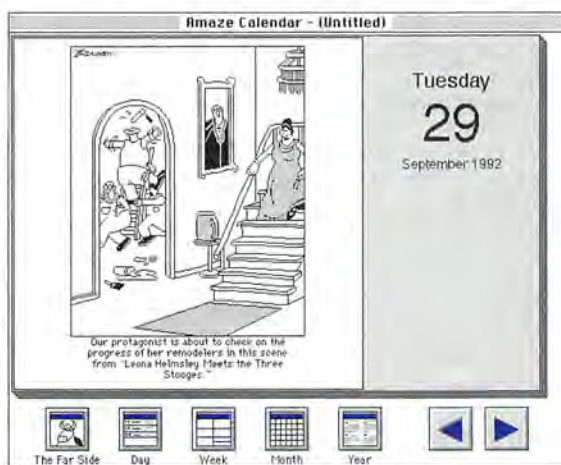
Other questions we asked included the following: Could you list the duration of an event as well as its start time? Could events overlap, and if so, did the program warn you about this? Could the monthly calendar view show the text description of each reminder? Could you delete an event from a reminder-alarm window without having to return to the program?

From the 16 products we evaluated, we selected our 7 favorites. They're discussed here, although not in any specific order of preference.

Alarming Events

No personal-scheduling program offers you as many options as CE Software's Alarming Events when a reminder-alarm window appears on your screen. Beyond

running the program requires that you open three document files. For two of them (Diary and Planner), you need a different version for each year. Appointments entered in the Diary are not shown in the Planner (and vice versa). Acknowledging an alarm requires that you remember special keyboard command equivalents, because no alert box appears.



The Far Side Calendar will bring a smile to your face, courtesy of Gary Larson's sense of humor and some clever bits of animation. The program itself, though, is less likely to leave you smiling.

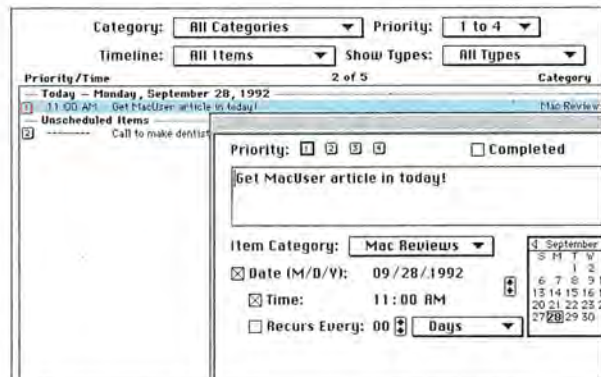


Figure 2: First Things First's list options are quite powerful. You can easily filter what is displayed in a list according to a selected date range, type of item, assigned priority level, or any number of user-defined category settings.

simply acknowledging the reminder, you can set a snooze time for the message to return, completely delete the reminder, or archive the reminder into a special accumulating-archive file. If that isn't enough, you can also elect to directly launch the full Alarming Events program.

Add to this a flexible set of advance-notification and recurring-interval settings plus a to-do-list function that carries forward each day's events until you check them as done, and you have a great reminder package.

But Alarming Events' display and printing options come up short. It displays reminder text only in daily and five-day views. A basic calendar view — the only other option — shows those days that contain (hidden) reminders in boldface. You can't even get an overall list of your reminders, except if you print it out. And when printing, you can't get anything except this list format.

Also, Alarming Events gives you no easy way to copy or duplicate events. A noteworthy addition to the most recent release, however, is a Find command, which you can use to search for specific text strings.

First Things First

The first thing you'll notice about First Things First, from Visionary Software, is how it appears on your desktop. It can sit unobtrusively on your menu bar, displaying the current time, or it can be placed anywhere else as a small graphic clock (with a choice of more than 20 different faces!). In either case, double-clicking on the display launches the program.

First Things First has no calendar or multiday displays. Everything is shown in a single list view, with events listed in chronological order and grouped by days. Although we consider this a disadvantage if you're looking for a scheduling program, First Things First's list options are exceptionally powerful, often exceeding those found in programs that emphasize more-graphic calendar displays.

Scheduling Software

For example, you can filter items displayed in First Things First's list according to date, choosing to see only those events scheduled for today, this week, or this month. You can also assign each item a priority and a category and choose to display only those items that belong to a given setting. The Find command, new in version 3.0, enables you to perform text-string searches as well.

In addition to creating typical timed reminders, you can create to-do items with no assigned time or date. These to-do items are listed separately in an unscheduled-items list. Once you've marked any item as completed, it is moved to a completed-items list — unless you have specified that such items are to be automatically deleted. The program moves to an overdue list any scheduled item that isn't marked as completed when it is due. All in all, First Things First provides a truly functional and flexible approach to scheduling.

You can set First Things First to give you advance warnings or to show simple recurring events (although only the next occurrence of the event is shown in the display list).

Visionary Software has enhanced the program's rudimentary printing functions in version 3.0 by including DynoPage Lite, a separate utility that permits printing in a variety of date-book formats.

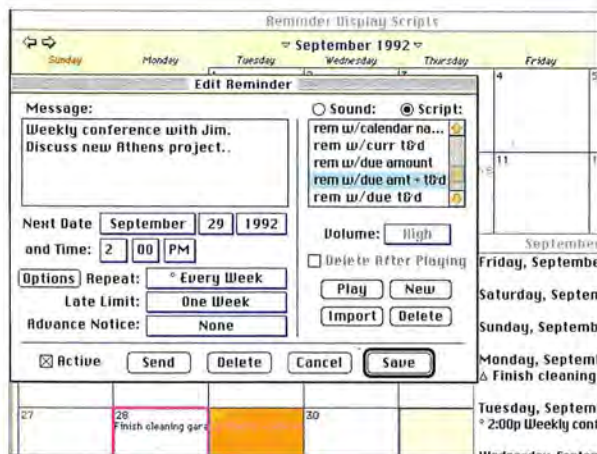


Figure 3: Easy Alarms combines an excellent alarm capability with a monthly calendar-view display (shown in the background here). From the event-entry window, you can assign a script to be played when a reminder is due.

Easy Alarms

Easy Alarms, from Essential Software, combines an excellent alarm capability with a monthly calendar-view display. The new version, 2.0, includes the text of each

The HyperCard Alternative

Several developers have chosen HyperCard as the basis for their scheduling software, among them Concentrix Technology, with Connections; P.I.M., with Info-mation; First Wave, with TimeMaker; and Nine to Five, with 9 to 5 Office.

There certainly is a solid rationale for using HyperCard to develop scheduling software. Because HyperCard is relatively accessible to nonprogrammers, it's easy for people to customize things. After all, an appointment book was among the sample stacks shipped with the original version of HyperCard.

The scope of the four programs mentioned here actually goes well beyond mere appointment scheduling. Easily exceeding the range of features found in the competition, they are also likely to include an address directory, contact file, phone dialer, phone log, letter writer, envelope addresser, labeler, and more.

Despite all this, we have serious reservations about the practicality of using any of these HyperCard-based programs.

First, the programs are RAM-hungry. They have to be, because you need to run HyperCard in order to use them. They

also use up large amounts of disk real estate. Not even counting the HyperCard application, each of these programs exceeds 2 megabytes in size.

And they are slow. A few operations, such as shifting to a new year, may take several minutes. In the case of one program, upgrading to its new version could supposedly take hours!

Alarm functions range from barely adequate to totally nonexistent. Printing options are too limited, unnecessarily complicated, or both.

To master the busy-looking displays of these programs, you usually have to spend too much time thumbing through the manuals. To be fair, though, this is partially due to these programs' wider range of features, compared with the stand-alone applications.

If, despite all this, you remain committed to sticking with HyperCard, get Connections, which is clearly the most ambitious of the group. Connections pushes HyperCard to its limits, with features such as an ever-present color tool palette. You'll

	Connections	Info-mation	TimeMaker	9 to 5 Office
	\$\$\$	\$\$\$	\$\$	\$\$
List price	\$199	\$189	\$89	\$19
Company	Concentrix Technology 1875 S. Grant St. Ste. 760 San Mateo, CA 94402 415-358-8600	P.I.M., Inc. 555 Pierce St. Ste. 5 Albany, CA 94706 510-559-4211	First Wave 6263 N. Scottsdale Rd. Ste. 190 Scottsdale, AZ 95250 602-951-3812	Nine to Five Software P.O. Box 18899 Boulder, CO 80308 303-443-4104

reminder in the date cell. Each date cell also has its own pop-up display, in which alarms and to-do items (which are carried forward appropriately) are listed separately. Alternatively, you can display a separate list of reminders for all items due on the current day, week, or month. The program offers no category or priority options.

Easy Alarms handles recurring events very well, allowing you to designate almost any type of timing (such as the next-to-last day of the month for the next three months) as well as holidays (the fourth Thursday of every November). You can choose between displaying only the next occurrence and displaying the future occurrences of an event. The only problem is that if you delete a single occurrence of an event, all the linked occurrences get deleted as well.

For printed output, Easy Alarms offers a choice among a list, a monthly calendar, and a daily or weekly date book. All are functional although rather Spartan in design.

The most noteworthy aspect of Easy Alarms is its unique scripting function, which links macros to individual alarms. You can use this, for example, to create a reminder that auto-saves documents every ten minutes, opens an application at a given time, or empties the Trash at predesignated times. You can also customize the reminder dialog box itself with features that are not a standard part of Easy Alarms. With the program's conditional statements, for

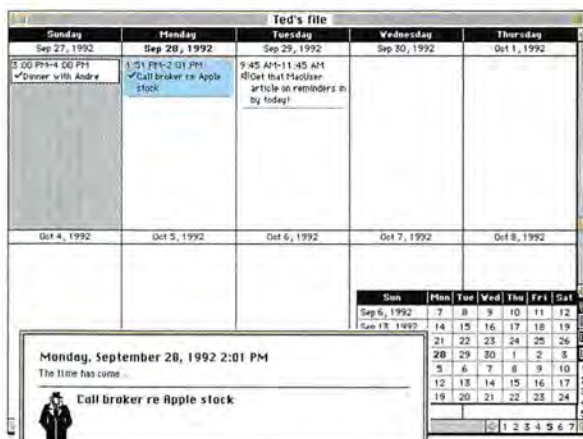


Figure 4: AgentDA's forte is the flexibility of its display. Selecting from the two sets of numbers in the lower-right-corner margin of the window specifies the number of rows and columns of date cells displayed.

example, you can create a reminder whose message varies depending on whether it's appearing as an advance warning or as a reminder of something due now. No other reminder program has a comparable feature, although QuickKeys users could mimic most of these effects.

AgentDA

The forte of AgentDA, from Team Building Technologies, is the flexibility of its display. With one or two mouse clicks, you can shift from a single-day view to a 35-day view or to almost any other number of days in between. For any view, you can choose between a calendar display and a scrollable appointment-book display. Unfortunately, the program ignores traditional monthly and weekly divisions; you can't simply elect, for example, to view December 1992.

AgentDA's recurring-interval function is more like a Duplicate command. Once set, the recurring reminders are not linked in any way. The program has no to-do-list function at all, although you can mark individual items as completed. On the plus side, you can easily move or copy items to different dates just by dragging them with the mouse.

The alarm function has been improved in version 2.1. In particular, you can now delete reminders directly from the notification window. The printing options are just adequate, however. Your only choice is between a monthly calendar and a simple appointment-book format.

Now Up-to-Date

For the best mix of powerful scheduling features with an aesthetically pleasing and easy-to-use interface, Now Software's Now Up-to-Date takes top honors. Its full-screen monthly calendar comes complete with graphics,

also find a time bar with appointment blocks you can modify by using the mouse, similar to what you can do in DateBook and Now Up-to-Date. And although it is still far from a speed demon, the new version, 2.1, is noticeably faster.

As a scheduler, Connections is generally competitive, with a choice of daily, monthly, or list views as well as options for recurring events and to-do items. However, editing events, from the month view in particular, is less convenient than it is in most similar programs. Because it is missing such expected features as advance warnings, Connections' alarm function meets only minimal expectations.



The best of the HyperCard schedulers is Connections. Its time bar (similar to Now Up-to-Date's and DateBook's) graphically indicates the time and duration of each scheduled event.

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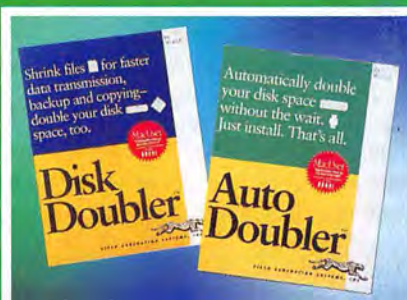
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Fifth Generation
UT10179

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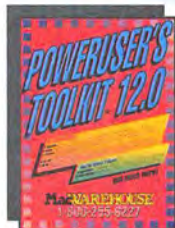
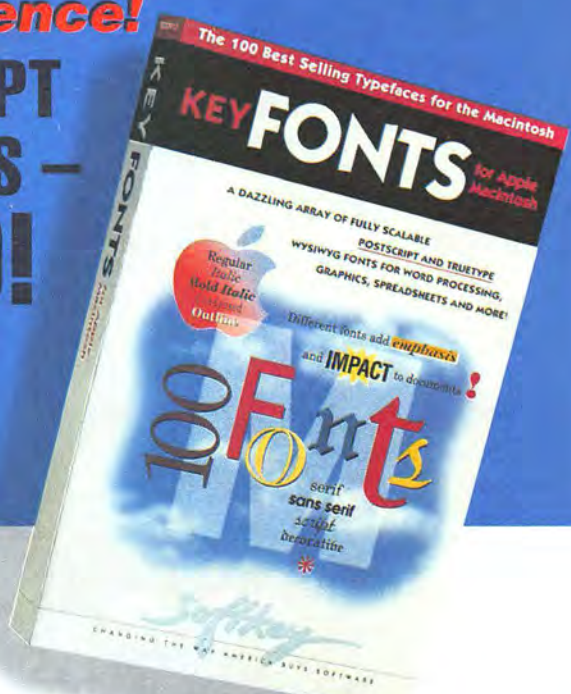
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Suggested Retail: \$59.95

System Requirements: Mac Plus or higher; 2MB RAM; hard disk drive; System 6 or later. TrueType requires System 7. ATM recommended for PostScript fonts.

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Micromat
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Claris	
BUS0201 ClarisWorks w/tree Quicken	199.
Decision Engineering, Inc.	
BUS0210 Crystal Ball 2.0	149.
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BUS0187 DeltaGraph Professional w/calculator	199.
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BUS0180 Control Classic 1.5	299.
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BUS0168 IdeaFisher 2.0	379.
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Power Up	
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BUS0073 Calendar Creator	44.
Round Lake Publishing	
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Softsync Publishing	
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Teleware, Inc.	
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COMMUNICATIONS & NETWORKING

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NET0250 AppleShare 3.1	969.
COM0131 AppleTalk Remote Access	165.
COM0126 Macintosh PC Exchange	69.
CE Software	
COM0101 QuickMail 2.5 (1-5 users)	249.
Dayna Communications, Inc.	
NET0125 DaynaPORT E/Z	269.
NET0076 DaynaPORT E/SE	149.
Ex Machina	
COM0111Noty! 1.1 Personal Edition	109.
Farallon™ Computing	
NET0007 PhoneNET® Plus, SE & II	31.
NET0019 PhoneNET StarController®	899.
NET0122 Timbuktu® 4.0.3	129.
NET0034 Timbuktu/Remote® 3.0	129.
FreeSoft	
COM0060 White Knight V.11	85.
Insignia (Full line available)	
UT01174 AccessPC 2.0	60.
COM0108SoftAT 2.5	299.
COM0107 Soft PC Universal 2.5	195.
Hayes	
COM0095HayesConnect 3.0	75.
Shiva	
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Sonic	
NET0290 Radar 3.0	279.
Synergy	
COM0003VersaTerm Pro 3.6	177.

TechWorks

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ENT0461 Bridge 7.0	19.
Baseline Publishing	
ENT0403 Talking Moose/Cartoon Carnival 4.0	23.
Broderbund	
CDR0042 Just Grandma and Me-CD-ROM	35.
GRA0268 Kid Pix 1.2	35.
Centron Software, Inc.	
ENT0329 BlackJack Strategy Tester/BlackJack Ace	65.
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HyperBot Software Company	
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MUS0105 MusicTime for Mac	169.
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Pluma Software	
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Software ToolWorks	
MUS0092 Miracle Piano	349.
XOR Corporation	
ENT0274 MacGolf Classic 1.1	52.
Zondervan Publishing House	
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BOK0021 MacBible - King James Version	79.

Fonts & Applications

Adobe Systems, Inc. (Full line available)	
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FON0295 Adobe Type Reunion	41.
FON0349 Adobe TypeStyle 2.0 w/ATM	127.
Softkey Software	
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Wayzata Technology	
FON0484 Font Fun House CD-ROM	35.

GRAPHICS & MULTIMEDIA

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CAD0032 Design Your Own Home-Architecture	ea 59.
GRA0339 Sprout!	45.
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GRA0400 Illustrator 3.2 (w/ ATM 2.0)	369.
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GRA0347 QuickTime Starter Kit	149.
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MacGlobe or MacUSA	Call.
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Aladdin Systems	
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Alsoft	
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Apple Computer, Inc.	
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SY00003 All Ease	55.
ASD Software, Inc.	
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UT0130 Fileguard 2.7 - Office Pack 5	479.
Baseline Publishing	
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UT0183 ScreenShot 1.2	34.
Berkeley System Design	
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Dantz Development	
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Symantec Corporation	
UT0151 Norton Utilities for the Mac 2.0	95.
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Teknosys	
UT0251 Help 1.02	89.
TGS Systems	
UNG0053 Prograph 2.5 Compiler Ver.	299.
UserLand Software	
UT0272 UserLand Frontier	189.

WORD PROCESSING

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WRD0026 MacWrite II 1.1	89.
Microlytics	
SPL0017 Word Finder Plus 4.0	45.
Microsoft	
WRD0059 Word 5.0	295.
WRD0001 Word 5.0 Upgrade	125.
Softsync Publishing	
WRD0057 ExpertWriter	29.
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Requires: 2MB RAM.
Publisher: MAXA
UTI0337

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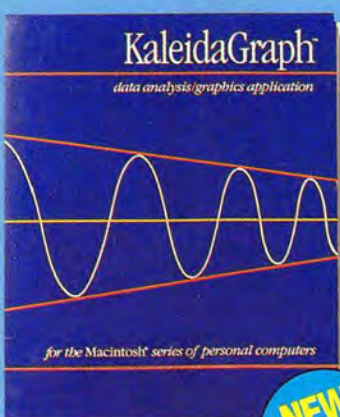
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ENT0461



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⑦ KaleidaGraph simplifies the process of analyzing and presenting statistical information. It provides 16 different graph structures, including scatter, histogram, probability plot, polar, as well as more common types, such as line, bar, and pie. You can crunch large amounts of data (up to 32,000 points per column), and plot up to 20 variables at once. Supports PostScript compatible printers including the DeskWriter C.

Publisher: Synergy
STA0018

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COM0138

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⑦ Sprout! is a complete computer planning tool for vegetable gardeners. Produces a graphic, scalable garden plan with correct plant and row spacing. Contains fully editable database of vegetables for 7 climate regions. Prints garden layouts, calendars, shopping lists, and reports. GRA0339

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Publisher:
Postcraft International
DTP0063

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⑦ Included are: Mighty Menus to give you the ability to tear menus from the menu bar of any application; Printer Picker lets you quickly select a network printer without visiting the Chooser; Desktop Extras to make filing files at the finder faster; Super Comments which preserves the Finder "Get Info" comments during desktop rebuild, and lets you edit or view them in any application; Trash Alias which prevents orphaned aliases; Helium Pro makes Balloon Help practical and Speed Beep Pro lets you customize your Mac's warning sounds. Publisher: Atticus UTI0306



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UTI0272



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Berkeley Systems

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Publisher: Power Up! Software

Also available:

Calendar Creator BUS0073 \$44

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BUS0268

\$99

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Publisher:
Abracadata, Ltd.
GRA0399

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Publisher:

Specular International
GRA0303

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MacDraft 2.1

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Publisher: Innovative Data Design
CAD0039

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Publisher: FreeSoft COM0060

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Publisher:
Amtex Software Corporation
ENT0443



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BND0150

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WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2 @ \$49 ea.)

The chart explains exactly what you need to achieve the desired level of performance.

To open your Mac Plus, SE, and Classics you'll need a specially designed tool — it's available from us as part of a handy tool kit for just \$9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single Inline Memory Modules). Each one megabyte SIMMs card holds eight top quality,

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 150ns or faster
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade a 2-socket Mac Classic II or LC to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 100ns or faster
4 MB	Install two 1 MB SIMMs
To upgrade a 2-socket Mac LC II to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 100ns or faster
6 MB	Install two 1 MB SIMMs.
To upgrade a 8-socket Mac II, IIfx, IIfx or SE/30 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 120ns or faster
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMs, install eight 1 MB SIMMs
To upgrade a 4-socket Mac IIfx to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 100ns or faster
5 MB	Install four 1 MB SIMMs.
To upgrade a 4-socket Quadra 700 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 80ns or faster
8 MB	Install four 1 MB SIMMs.
To upgrade a 16-socket Quadra 900 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 80ns or faster
4 MB	Install four 1 MB SIMMs.
8 MB	Install eight 1 MB SIMMs.
12 MB	Install twelve 1 MB SIMMs.

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Scheduling Software

multiday banners, and even yellow Post-it notes. From there you can shift to yearly, weekly, multiday, or single-day views. In the day views, events are indicated graphically with blocks that span the event's duration. Overlapping events are clearly indicated as horizontally adjacent blocks.

Navigation among the views generally works as you would expect. Double-click on an event to bring up more detail about it. Double-click on a date cell to open the single-day view. To reschedule an event, drag it to any new location. However, for navigating to dates that are distant from the current date, Up-to-Date is missing the convenient pop-up menus that are found in most of the other programs.

For modifying the time of a recurring event, Now Up-to-Date offers a choice of affecting the single selected event only, all future occurrences, or all occurrences.

Printing options include monthly calendars as well as appointment books, both of which are easy to set up. Unfortunately, there's no way to select a range of months when you're printing a monthly calendar.

With only a snooze-alarm option, the reminder function could be improved. Now Up-to-Date also lacks any sort of to-do-list capability. There isn't even a way to indicate that

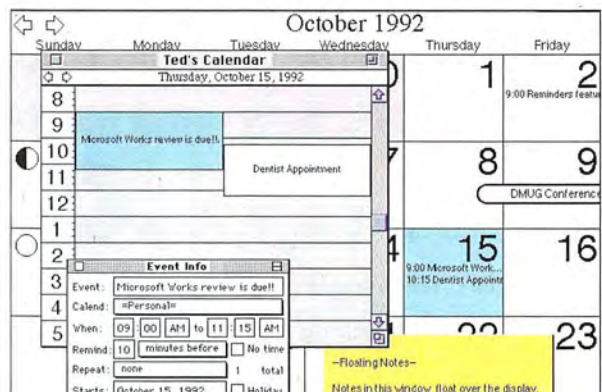


Figure 5: Now Up-to-Date has an easy-to-use interface and the best mix of powerful scheduling features. The full-screen monthly calendar sits in the background. Floating on top is a daily-appointment window, an Event Info window (for details of a single event), and a sticky (Floating Notes) note.

an event has been completed. And in an exception to the program's emphasis on ease of use, Now Up-to-Date unnecessarily requires that you use its networking features if you want to assign categories to events.

Table 1: Features of Scheduling Software

	<p>◆ = poor ◆◆ = average ◆◆◆ = above average</p>			
	AgentDA 2.1	Alarming Events 1.1	DateBook 1.5	DayMaker 1.01
Description	Application with extension	Extension on Apple menu	Application with extension	Application with extension on Apple menu
Event entry	◆◆	◆◆	◆◆	◆◆
Alarm-notification options	◆◆◆	◆◆◆	◆◆	◆
Event deletion	◆◆	◆◆	◆	◆
To-do lists	◆	◆◆	◆◆◆	◆◆◆
Category and priority settings	NA	NA	◆◆	◆◆◆
Recurring events	◆	◆	◆◆	NA*
Event-duration indication	◆◆	◆	◆◆	◆◆
Event scheduling and duplication	◆◆	◆	◆◆	◆
Find and navigate	◆◆	◆	◆◆◆	◆◆
Multiple display views	◆◆	◆	◆◆◆	◆◆◆
Banners and icons in calendar view	NA	NA	◆◆	NA
Printing options	◆	◆	◆◆◆	◆◆◆
Archiving	NA	◆◆	◆◆	NA
Networking	NA	◆	◆◆	NA

* Feature added or improved in new version.

Almost all of these problems should be remedied in Up-to-Date 2.0 (which should be available by press time). The new version adds to-do items, a list view, personal category settings, priority settings, scrollable text in date cells, the ability to delete alarms directly from the reminder window, and improved options for printing monthly calendars. Only the weak navigational features are left unimproved.

DayMaker

DayMaker initially defined the high end of reminder and scheduling software. To the expected array of features, Pastel Development added an impressive (although often overly complicated) system of category and priority assignments.

You can set separate to-do-list items to carry forward at your choice of daily, weekly, or monthly intervals. The program has an exceptionally extensive selection of display options, including monthly, weekly, daily, and several list views. In the monthly view, you can type in each date cell, which scrolls so that you can view the complete text. You can filter list displays to show only events that meet given time, category, or priority criteria. Add to this a customizable set of printing options, a phone dialer, and a

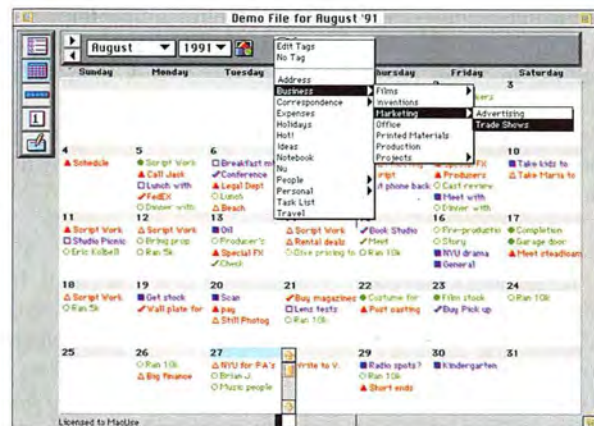


Figure 6: DayMaker boasts an array of features. The symbols in front of each event indicate priority levels. Note how a scroll bar appears when you select an individual date cell (August 27). The pop-up menu shows a sampling of DayMaker's hierarchical category tags.

minidatabase, and you have a scheduling program that's very feature-rich.

Still, given this breadth of features, DayMaker suffers from a couple of surprising omissions. It has no option for

Table 1: Features of Scheduling Software, continued

◆ = poor			
◆◆ = average			
◆◆◆ = above average			
	Easy Alarms 2.0.3	First Things First 3.0	Now Up-to-Date 1.0.1
Description	Application with extension	Extension displays on menu bar or as an icon on desktop	Application with control panel and extensions
Event entry	◆◆	◆◆	◆◆◆
Alarm-notification options	◆◆◆	◆◆◆	◆◆
Event deletion	◆◆	◆◆◆	◆*
To-do lists	◆◆	◆◆	NA*
Category and priority settings	NA	◆◆◆	◆*
Recurring events	◆◆◆	◆	◆◆◆
Event-duration indication	NA	NA	◆◆◆
Event rescheduling and duplication	◆	◆◆	◆◆◆
Find and navigate	◆◆	◆	◆
Multiple display views	◆◆	◆	◆◆◆
Banners and icons in calendar view	NA	NA	◆◆◆
Printing options	◆◆	◆	◆◆*
Archiving	NA	NA	NA
Networking	◆◆	NA	◆◆◆

*Feature added or improved in new version.

Scheduling Software

recurring events — not even a method for simple duplication of events. Its alarm features are adequate, although setting an alarm tends to require more work than with other programs.

However, version 2.0 (which was in beta at press time) promises to add recurring events, a new to-do-items window, and simpler printing and event-entry methods.

DateBook

After Hours Software's DateBook wants to do it all. It matches almost every item on DayMaker's impressive features list. You can choose calendar views from yearly to daily or shift to any number of user-definable list views. The program has category and priority settings and an elaborate Find function that can do searches based on almost any criteria. Like DayMaker, DateBook enables you to save a particular set of search criteria and list it on the menu bar for future use. Better yet, DateBook's features are easier to use than the comparable features in DayMaker.

DateBook matches Now Up-to-Date with multiday banners and icons in its monthly view plus a time-bar event display similar to Up-to-Date's event blocks. Still, DateBook's overall display seems unnecessarily busy when compared with Now Up-to-Date's cleaner design. On the other hand, it is far easier to navigate to distant dates

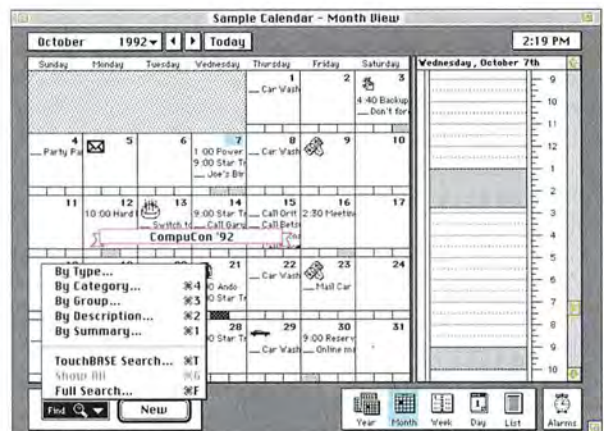


Figure 7: DateBook tries to do it all. Shown here is the monthly calendar view, with its single-day time bar to the right. The shaded blocks represent scheduled events. The pop-up menu displayed here hints at the wide range of search criteria available with DateBook's Find function.

with DateBook than it is to do so with Up-to-Date.

DateBook permits you to schedule overlapping events. The program also shows event text in the date cells of the monthly view, although so little text is visible that you often can't identify the event.

Table 2: Which Scheduling Software Should You Buy?

	AgentDA 2.1 ***	Alarming Events 1.1 ***½	DateBook 1.5 ****	DayMaker 1.01 ***½
List price	\$99	\$99.95	\$125	\$99
Pros	Adjustable calendar display can show almost any range of days, from 1 to 35. Events can be dragged by mouse to a new location and can be deleted from reminder window.	Best selection of options available in the reminder window, including deleting or archiving the event.	Robust Find function easily selects from a wide range of search criteria. User-definable list views. Banners in monthly calendar.	Excellent to-do-items features. Direct entry of text into monthly date cells, with scroll bars as needed. User-definable list views.
Cons	No to-do items. Cannot conveniently select standard monthly view. Limited printing options.	No convenient way to duplicate or move events. Limited calendar view cannot show any text of scheduled events.	Printing options are complex and don't always work. Text in date cells is too limited to be useful. Priority settings accessible only for to-do items.	No recurring events (this feature will be added to version 2.0). Methods for assigning event categories, setting alarms, and printing schedules are overly complex.
Company	Team Building Technologies 836 Bloomfield Ave. Montreal PQ H2V 3S6 Canada 514-278-3010 514-278-2874 (fax)	CE Software, Inc. P.O. Box 65580 1801 Industrial Cir. West Des Moines, IA 50265 515-224-4534 515-224-4534 (fax)	After Hours Software Tri Center Plaza 5990 Sepulveda Blvd. Van Nuys, CA 90064 818-780-2220 818-780-2666 (fax)	Pastel Development Corp. 113 Spring St. New York, NY 10012 212-941-7500 212-431-3079 (fax)

DateBook has a wealth of printing options, and not surprisingly, printing is probably the program's most complicated feature. The manual even seems to give up in despair and suggests calling After Hours' technical support for further help. To make matters worse, we discovered at least one serious bug in printing out appointment books: Some text overlapped and was unreadable.

The Bottom Line


If you primarily want on-screen alarms and aren't much concerned about calendar displays or elaborate print options, stick with those programs that emphasize alarms: Alarming Events, First Things First, or Easy Alarms. They generally give you the best alarm options without saddling you with excess baggage you won't ever use.

Of the three, no one program clearly stands at the top. Alarming Events shines with more options in its reminder-notification box than any other program, but for the absolute limit in alarm flexibility, you can't beat Easy Alarms' macrolike scripting feature — assuming you're willing to take the time to master it. First Things First has the slickest and most convenient on-screen access, with its ever-present clock displays. It's also the only one of this group to offer category and priority settings. (We also consider AgentDA an acceptable choice here.)

If you're more concerned with the visual and printed

display of your schedule, then your choice is among Now Up-to-Date, DayMaker, and DateBook. Although you can also use these programs for alarms, that's not their strong suit. A problem shared by all three of these "high end" programs is that they lack an effective way to globally delete selected events, however.

Overall, we recommend Now Up-to-Date. True, version 1.0 is missing some significant features that are available in DateBook and DayMaker, such as to-do lists and user-defined list views. But it has all the most critical features and is by far the easiest and most pleasant program to use. Otherwise, for the full range of schedule-display and -printing options, we slightly prefer DateBook over DayMaker, primarily because DateBook includes recurring events and is generally easier to use.

However, because of the impending revisions to two of these products, the recommendations here are a bit volatile. Now Up-to-Date 2.0 promises to fill in its current gaps and more clearly distance itself from the others. On the other hand, DayMaker 2.0, by adding recurring events and somewhat simplifying its interface, is likely to tighten the race. For potential buyers of a scheduling program, it's a win-win situation. 

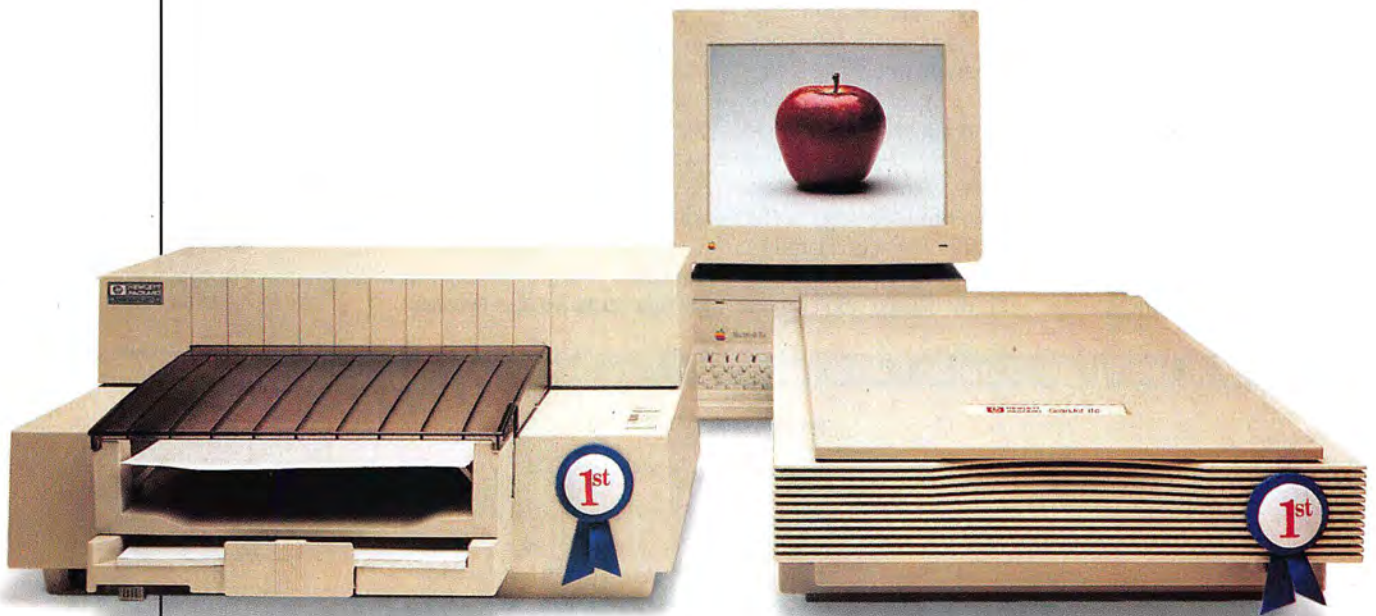
Ted Landau is a MacUser contributing editor and the author of the forthcoming *Sad Macs, Bombs, and Other Disasters*.

Table 2: Which Scheduling Software Should You Buy? continued

	Easy Alarms 2.0.3 ★★★½	First Things First 3.0 ★★★½	Now Up-to-Date 1.0.1 ★★★★
List price	\$99	\$79.95	\$99
Pros	Script option gives macrolike power to alarms. Can set to auto-delete past reminders after a set number of days. Very good recurring-event options.	Always-visible on-screen clocks give quick access to program. Can assign priorities and categories.	Top-notch options for setting and deleting recurring events. Can set time and duration of a new event with just one mouse drag. Exceptionally clear graphic displays.
Cons	No convenient way to duplicate or move events. Has only a monthly calendar and a list view.	Can display events only in a list view. Lists only next occurrence of recurring events.	No to-do items. Assigning categories requires using networking features (version 2.0 is expected to correct these problems).
Company	Essential Software 28 Mulford Ave. Stantsburg, NY 12580 914-889-8365	Visionary Software P.O. Box 69447 Portland, OR 97201 503-246-6200 503-452-1198 (fax)	Now Software, Inc. 520 S.W. Harrison Ste. 435 Portland, OR 97201 503-274-2800 503-274-0670 (fax)

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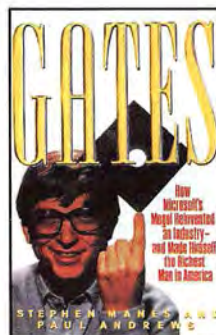
Gates

Microsoft: hero or villain? The company is both the publisher of the most widely used Mac applications and the creator of Windows, the biggest challenge the Mac has ever faced. In their definitive new biography of William Henry Gates, two veteran Microsoft watchers take you inside the mind of the man who more than any other single individual controls the fate of the company that — perhaps as much as Apple — controls the fate of your Macintosh.

BY STEPHEN MANES AND PAUL ANDREWS

MacUser comments appear in yellow type.

**How Microsoft's
Mogul Reinvented
an Industry —
and Made Himself
the Richest Man
in America**



The following edited exclusive excerpts are from the authoritative 544-page book by Stephen Manes and Paul Andrews (New York: Doubleday, 1993; \$25).

It's the world's highest-stakes poker game: The battle to produce the software that will make personal computers the technological revolution of the century. Nearly everyone who uses a computer — Mac and PC user alike — has anted up into Microsoft's enormous share of the kitty, and Bill Gates is and has always been the dealer.

As an undergraduate at Harvard, Bill found a new use for applied math: poker. In a sparsely furnished chamber of Currier House, the coed dorm on the Radcliffe campus where Bill roomed, the young scholars played for stakes connoted mathematically by fractional denominator. In the relatively rare and rarefied /1 game, pronounced “slash-one,” chips were bought and sold at their full value: Red, for example, was worth a quarter. In the lower-stakes /20 game, known as the buffoon game, the chips would be worth one-twentieth of their nominal value. The fractions

ranged as low as /100 — known as the idiot game.

Math, socializing, arcane terminology, humor, and cutthroat competition — poker was a perfect package for the kid whose family nickname, “Trey,” had come from the world of cardplaying. Initially Bill was found at the buffoon table, where his unorthodox dealing technique — distributing from his lap, a sort of under-the-table deal — was immortalized as “Gatesing the deck.” He quickly graduated to high-stakes sessions with graduate students. By most accounts, Gates, better at math than at bluffing, was a hit-and-miss player — as likely to lose \$500 as to win \$400.

Initially Bill was found at the buffoon table, where his unorthodox dealing technique — distributing from his lap, a sort of under-the-table deal — was immortalized as ‘Gatesing the deck.’

Gates would face a world-class cast of characters in the high-stakes world of betting and bluffing the future of hardware and software, including players from the worlds of Silicon Valley, presidential politics, and Hollywood.

Steve Jobs and Steve Wozniak

Another Gates obsession at the time was a video game called Breakout, a more abstract sort of super-Pong involving the destruction of bricks with a rectangular “ball.” The game had been designed for Atari in four days by two young Silicon Valley engineers

who would eventually cross Bill Gates's path. Steve Jobs, who was working for Atari, received the \$5,000 check for the job, gave the trusting Steve Wozniak his "half" — \$350 — and pocketed the rest. They would later go on to collaborate on a computer called the Apple I.

H. Ross Perot

In August 1979, Gates visited Dallas and the headquarters of Electronic Data Systems, the giant computer-service company headed by H. Ross Perot — in a sense the Mr. Software of mainframes — who had become interested in the fledgling microcomputer industry and its leading citizens. The year before, Perot had made overtures to Apple.

Perot wound up kicking himself over the deal. 'I should have just said, now Bill, you set the price, and I'll take it. I consider it one of the biggest business mistakes I've ever made.'

Now EDS was contacting Bill Gates about the possibility of a buyout.

"He flew down to Dallas, got his hair cut at an airport barbershop, to go out and visit. And he came back with an offer to purchase this company. It was an amazing thing," Bill's mother recalled.

"It's this big office on top of this building," Gates recalled. "He had this kind of anteroom to this big office with very fancy stuff — an American eagle, the flag, and all these famous pictures." Then "this guy comes out, and he's this little tiny guy, [from] a special elevator." As Gates remembered it, Perot asked him, "If I buy this, will I make money? Why would you sell?"

As Perot remembered it years later, "There was no division at all in terms of our interest and our sense that he would build a great company and our sense that he was absolutely on the right track with what he was doing." The division was over money; in Perot's opinion, Bill wanted too much of it — somewhere between \$40 and \$60 million in Perot's recollection, somewhere between \$6 and \$15 million in Bill's.

Perot wound up kicking himself over the deal. "I should have just said, now Bill, you set the price, and I'll take it," Perot said. "That's what I should have done, and I've always regretted that we didn't get together . . . I consider it one of the biggest business mistakes I've ever made." Gates "has never kidded me about that, but I think if the shoe were on the other foot, I'd probably needle him."

"I sent them a nice 'No' letter," Bill Gates pointed out.

Gates

Michael Ovitz

In an omen of the melding of electronics and entertainment, Gates took a meeting in 1992 with Hollywood power broker Michael Ovitz, the Creative Artists Agency chairman who had helped put together the Matsushita purchase of MCA, the parent company of Universal Studios. Ovitz had already spent time talking to Apple's John Sculley, who, like Gates, had deals cooking with Sony, now owner of Columbia

'Hero is a strong word,' Gates said. But if Bill had an idol, it was Richard Feynman, the quirky, eccentric physicist who, as Gates put it, 'had his own way of thinking about things.'

Pictures. With multimedia looking like the Next Big Thing, the New New Hollywood of software for computer screens was beginning to close ranks with the Old New Hollywood of software for television and theater screens.

Richard Feynman

"Hero is a strong word," Gates said. But if Bill had an idol, it was Richard Feynman, the quirky, eccentric physicist who had worked on the Manhattan Project, traced the *Challenger* disaster to defective O-rings, and won the Nobel Prize for his revision of quantum mechanics. Feynman, as Gates put it, "had his own way of thinking about things. He was his own guy who decided what counted and what did not, built his values around what he understood and not some artificial way of looking at things." At one point, Gates had planned to meet with Feynman to discuss distributing a videotaped series of his lectures. "It's the coolest way to learn physics ever," he said wistfully. "It's funny. It's interesting. I'd love to give a lecture like that someday." But Feynman died before Gates had a chance to meet him, and Bill took the death to heart.

Bluffing is a critical weapon in every poker player's arsenal of tricks. Gates is no stranger to the technique.

In a mid-1980s presentation to Apple managers, Gates would state flatly that "between 1970 and 1974 we pursued specialized applications. We programmed about half the elevators in the United States today. [They] have microcomputer programs that we developed that decide when the elevator should

go up, when it should go down.” This, as Gates would admit long after retailing this fiction, “never happened.” The truth? Back when he had waited around for elevators as a congressional page, he had mentally toyed with some scheduling algorithms.

Over the years, Microsoft's focus shifted from languages and OEM products to user-friendly applications, as Gates became convinced that GUIs (graphical user interfaces) were the wave of the future — setting the stage for the biggest hand that either Microsoft or Apple had ever played.

On the August day in 1981 when he came to Microsoft to present the latest revision of his vision, Steve Jobs thought he had the future in his pocket. He chortled over Apple's latest coup: a full-page ad in the *Wall Street Journal* twitting the newly introduced IBM PC and headlined “Welcome, IBM. Seriously.” Jobs thought it was perfect; on the plane north to Microsoft, he gleefully passed the ad around to the Apple team traveling with him. Blinded by his own tunnel vision, Jobs was blissfully unaware that the clunky IBM PC, which had first sprung to life in a closet down the hall from Bill's office, was about to give Apple fits.

Jobs could think only about the far more dazzling state-of-the-art Apple computers he had up his sleeve. Back in 1979, on a tour of Xerox PARC, Jobs had become an instant convert to the religion of the GUI. It was the wave of the future, he was sure, and he would ride it for all it

Blinded by his own tunnel vision, Jobs was blissfully unaware that the clunky IBM PC, which had first sprung to life in a closet down the hall from Bill's office, was about to give Apple fits.

was worth. To the Microsoft group, he gave a mesmerizing performance. He was going to build a factory where sand, the silicon that computer chips were based on, would go in one end and emerge at the other as an “information appliance.”

Two key issues were emerging: Which applications should Microsoft develop for the Mac, and should they be bundled — included free — with every machine? The PC universe was changing. Users cared less and less about languages and more and more about applications. The applications they wanted most were word processors and spreadsheets.



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8XL	479	8 1152 x 870	4		
PaintBoard Li	829	24 1024 x 768	4	■	
24STV	799	24 640 x 480	1	■	Up to 30
MediaTime	1,599	24 640 x 480	1		Up to 30
SUPERMAC					
Spectrum/24 PDQ Plus	\$1,549	24 1152 x 870	4	■	
Spectrum/8	419	8 1152 x 870	4		
Spectrum/24 Series III	829	24 1024 x 768	3	■	
Spectrum/8•24 PDQ	829	24 640 x 480	4		
Spectrum/8•24	579	24 640 x 480	4		
Video Spigot	369	24 160 x 120	1		Up to 30
Video Spigot & Sound	749	24 160 x 120	1		Up to 30
RADIUS					
Precision Color 24X	\$1,649	24 1152 x 882	4	■	
Precision Color 8XJ	499	8 1152 x 882	4	■	
Precision Color 8X	749	8 1152 x 882	4	■	
Precision Color 24XK	829	24 1024 x 768	3	■	
Precision Color 24XP	499	24 832 x 624	2	■	
Video Vision	1,979	24 640 x 480	4		Up to 30

Monitors shown on this page are listed in the chart at right.

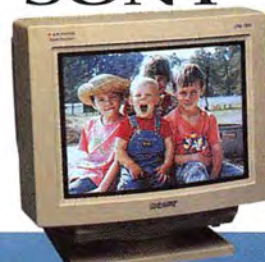
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A. Radius 21" Color	\$3,069	Hitachi					■	■		
B. RasterOps 21" Color	2,799	Hitachi					■	■		
C. RealTech 21" Mono/Grayscale	795	—					■	■		■
D. SuperMac (SuperMatch) 21"	2,529	Hitachi					■	■		
SuperMac 21" Mono/Grayscale	989	—					■	■		
E. RasterOps 20" Trinitron Multi-Mode	\$2,329	Trinitron	■	■	■	■	■	■		
Radius Precision Color 20"	2,389	Trinitron	■	■	■	■	■	■		
RasterOps 20" Hitachi Color	1,469	Hitachi	■	■	■	■	■	■		
F. RealTech 20" Trinitron Multi-Mode	1,895	Trinitron	■	■	■	■	■	■		■
G. SuperMac 20" (SuperMatch)	1,499	Hitachi			■			■		
H. SuperMac 20" (SuperMatch Dual-Mode)	2,499	Trinitron			■	■	■	■		
I. NEC 17" 5FG Color	\$1,589	Toshiba	■	■	■	■	■	■		
J. RasterOps 16" (RasterOps Sweet 16)	1,249	Panasonic		■				■		
K. RealTech 17" (RealTech Multi-Mode)	995	Hitachi	■	■	■		■	■		■
L. Sony 17"	1,189	Trinitron	■	■	■		■	■		■
M. Seiko 17" (1760)	1,149	Trinitron	■		■		■	■		
Radius 15" Precision Color Pivot (at left)	\$959	Non-Trinitron	■	■	■	■	■	■		■
RealTech 15" Grayscale (shown at left)	449	—		■				■		■
Seiko 14" Color 1445 (shown at left)	479	Trinitron	■					■		■
Sony 13" Color (shown at left)	689	Trinitron	■					■		■

HARDWARE THAT FITS

Toll-free phone ordering
(or fax 24 hours a day)

FAX:
1-409-539-4141



We've got personality!

At Hardware That Fits, your order isn't taken by a lackluster clerk who merely wants to fill today's quota. A real person who actually cares about helping solve your problem will answer your call. A few of those friendly folks are pictured here. Front row, left to right: Dona, Gina, Barbara. Standing: Jim, Don, Mike, Cecil.



The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with Transparency Option (shown at right), then adjusted with ScanMatch and color-corrected with Adobe Photoshop.

Real Tech™



Scanners.

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.

	Price	DPI	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II <i>Includes ScanMatch color calibration software</i>	\$909	600	14	8.5 x 11	■			Includes limited version of Adobe Photoshop
Scanmaker IIIXE <i>Includes ScanMatch color calibration software</i>	1,179	600	14	8.5 x 11	■			Includes full version of Adobe Photoshop
Scanmaker 1850 Slide Scanner	1,569	1850	14	2.5 square inches			■	Includes full version of Adobe Photoshop
REALTECH								
Scan 800 <i>Optional Adobe Photoshop</i>	\$1,199 200	800	200	8.5 x 11.75	■			Includes ScanMatch color calibration software
Scan 800 with Transparency Option	1,695	800	200	8.5 x 11.75	■	■	■	
SEIKO								
SpectraPoint	\$2,099	800	14	8.5 x 11.6	■			Includes full version of Adobe Photoshop
UMAX								
UC 630	\$1,179	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
UC 1200S	3,179	1200	51	8 x 11.8	■	■	■	Includes full version of Adobe Photoshop
Transparency Option	729	(1200)	(51)		■	■	■	

SII

Seiko SpectraPoint



MICROTEK



Microtek Scanmaker II



Microtek Scanmaker 1850 Slide Scanner

HARDWARE THAT FITS



Color printers.

SII Seiko Instruments Personal ColorPoint PS

\$3,595 Lease: \$99/mo.

Prints full-bleed comps on plain laser paper or transparency film. 300 dpi color thermal printer uses 16 MHz RISC processor. 6 Mb RAM standard, upgradable to 10 or 22 Mb. Adobe PostScript® compatible. Download, process and print simultaneously with the



ColorPoint's multiple frame buffers. Includes AppleTalk, parallel, and RS-232 interfaces, plus a SCSI port. Continuously polls all interfaces; reconfigures automatically. 39 resident fonts.



RasterOps

\$7,895

Lease: \$216/mo.

RasterOps CorrectPrint 300 Dye Sublimation Printer

Uses a 4-color (CMYK) dye sublimation thermal process at 300 dpi to print a continuous-tone image that resembles photographic-quality output. Prints on special sheetfed paper or transparencies, not on rolls. Uses a RISC controller with JPEG compression. Three standard interfaces. 35 resident fonts.

“ We compared your color printer... The RealTech Color 350 was the clear winner in price, performance, 'live' image area, ease of use and installation....we saved a considerable amount of money on service bureau charges and were able to meet a very stringent deadline. Our client was particularly pleased by the vibrant colors and the sharpness of the output. **”**

— Achinta K. Mitra
TIECAS Type & Graphics, Inc.

Add color to your comps or presentations for only \$1.13 per tabloid-size page!



Real
Tech™

RealTech Color 350

\$5,995

Lease: \$164/mo.

Prints 11x17 (OB size) edge-to-edge comps on laser paper or letter-size transparencies, not on rolls. Can print on both sides of the paper. 300 dpi output. Creates true black text because it uses 4 colored ink sheets (cyan, magenta, yellow, black). 10 Mb of RAM (upgradable to 18 or 34 Mb); 3 standard interfaces. 39 resident fonts. Letter-size 4-color output costs only 69¢ per copy. An 11x17 OB-size color printout costs about \$1.13.

RISC processor.
Adobe PostScript®
compatible;
PANTONE®
approved*
color
matching.

*PANTONE is
Pantone, Inc.'s
check-
standard
trademark
for color.



DID YOU WIN \$1000 off your next order... and not even know it?*



We have an unclaimed prize of \$1000. Could it be you? Check your Hardware That Fits "SOLUTIONS" catalog to see if your number matches one of the numbers listed below. If it does, you're the winner we've been looking for!

If you're one of our instant monthly winners, we'll give you a gift certificate good for \$1000 worth of products from our catalog! You win if the last 6 digits of the number on your catalog exactly match one of these of numbers:

048711, 027450, 163941, 372342, or 547893; 489210, 654381, 706518, 801402, or 257412; 545811, 648057, 398679, 275406, or 192858. To redeem your \$1000 gift certificate, mail us the back cover and order form of the catalog with your next order before March 1, 1993. If you haven't received a catalog, call us toll-free and we'll mail you a copy right away (sorry, it won't have a sweepstakes number on it).

*OFFICIAL RULES. Gift certificates for winning numbers listed in this issue (February 1993) will be honored only on orders placed between the magazine issue date and March 1, 1993, and only if the winning number is validated by mailing in the catalog's back cover and order form to: Hardware That Fits, 610 S. Frazier, Conroe, TX 77301. This promotion is open to persons 18 years of age or older, except employees of Micro Business Solutions, Inc., its affiliates, subsidiaries, advertising and promotion agencies and members of their immediate families. Taxes and shipping are the responsibility of the winner(s). Winning constitutes permission to use the names and likenesses of winners for publicity and promotional purposes. Void where prohibited by law.

CUSTOMER SERVICE

When you order from us, you get computer experts, not clerks! All of our salespeople have a minimum of three years of computer experience. They're trained in Apple's intensive program, as well as our own. They're ready to help you (with a smile!) both before and after the sale.

FINANCING OPTIONS

We've made it easier than ever to own our productivity-enhancing products.

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All prices are subject to change without notice. ©1993.

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Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. We have the best tech support in the business. And it's toll-free: **1-800-364-MACS.**

GUARANTEE

Our famous guarantee: If you don't like it, we'll buy it back. If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll refund your purchase price (minus consumables for printers).

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LEASING OPTIONS

- 1 **True Lease...**with 10% buy-out option
- 2 **Installment Lease...**with \$1.00 buy-out option
- 3 **Speed Lease...**90- or 180-day terms, with buy-out or conversion to other leases
- 4 **20/20 Lease...**10% security deposit, 20 equal payments, 10% buy-out
- 5 **90-day Deferred Lease...**no payment for 90 days; first and last payment in advance

*All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice.

NOTE: Minimum lease payment is \$50 per month.

Toll-free information: 1-800-364-LESS
HARDWARE THAT FITS • 610 S. Frazier • Conroe, TX 77301



Printed on recycled paper to show our concern for the environment.

Printing solutions.

Laser printers.

The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

Dpi
Engine speed
RAM

Interpreter
Microprocessor

Duty cycle
Paper trays

SCSI port
Interfaces

Resident fonts
Misc.

Do you need to print complex graphics on a daily basis or large quantities of high-quality, time-sensitive documents? We can recommend the right printer for your needs.

NEC Silentwriter Model 95

\$1,469

Lease: \$40/month

- 300 dpi
- 6 pages/min.
- 2 Mb RAM (expandable to 5 Mb)

- Adobe PostScript Level 2
- Motorola 68000 processor

- 6,000 pages per month
- Built-in envelope feeder & 250-sheet tray; optional 2nd tray available in letter or legal sizes

- No SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 Micro-fine toner and NEC's patented "Sharp Edge" technology create sharp black print quality

NEC



newgen

- 400 dpi
- 4 pages/min.
- 4 Mb RAM (expandable to 16 Mb)

- PostScript compatible
- Weitek XL-8220 processor

- 3,500 pages per month
- Optional 2nd paper drawer

- Optional SCSI port
- Appletalk RS-422, parallel, RS-232C

- 35

NewGen 400P

\$1,879

Lease: \$51/month

RealTech

- 300 dpi
- 9 pages/min.
- 2 Mb RAM (expandable to 10 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor

- 5,000 pages per month
- Optional 2nd paper tray & cassette feeder are available for \$250 (for both)

- SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 ATM font rendering technology builds raw type characters 4 to 5 times faster, enabling the RealTech Laser to print complex documents faster than other printers in its price range.

RealTech Laser

\$1,595

Lease: \$44/month

★★★★ 1/2
Reprinted from
MacUser, Sept. 1992.
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Communications Co.

★★★★ 1/2
"The RealTech features not just a genuine Adobe interpreter, but also a PostScript Level 2 raster image processor (RIP), which earns it more than a few points for forward compatibility."
— PUBLISH MAGAZINE, Feb. 1992



"Genius level" memory is dynamically allocated and automatically reclaimed.

Texas Instruments MicroLaser XL Turbo

\$2,795

Lease: \$77/month

- 300 dpi
- 16 pages/min.
- 2.5 Mb RAM (expandable to 10.5 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor

- 25,000 pages per month
- Optional 2nd paper drawer

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35

TEXAS INSTRUMENTS



Texas Instruments MicroLaser Plus

\$1,249

Lease: \$34/month

- 300 dpi
- 9 pages/min.
- 1.5 Mb RAM (expandable to 4.5 Mb)

- Adobe PostScript Level 1
- Motorola 68000 processor

- 10,000 pages per month
- Optional 2nd paper drawer and envelope feeder

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 17 Available with 35 resident fonts (\$1349)

The only 11x17 printer with Adobe PostScript Level 2 for less than \$3500.



- Choice of 300 or 400 dpi
- 15 ppm (letter size); 8 ppm (tabloid size)
- 4 Mb RAM (expandable to 16 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor (and ATM font rendering technology)

- 30,000 pages per month
- Two paper trays included (one tray for letter size; one tray for tabloid size.)

- SCSI port
- Three interface ports: Appletalk RS-422, IBM PC parallel, and RS-232C.

- 35

★★★★ MACWORLD MAGAZINE September 1992

"...be forewarned: PostScript-clone printers still have a long way to go before they can rival true Adobe PostScript printers."

Quote from MacUser September 1992 issue, "Personal PostScript Printers" by Bruce Fraser.

RealTech Laser 400

\$3,195

Lease: \$88/mo.

QMS 860 Hammerhead*

\$4,279

Lease: \$117/mo.

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 Mb RAM (expandable to 32)

- Adobe PostScript compatible
- Intel 80960CA RISC processor

- 10,000 pages per month
- Optional 2nd paper cassette

- SCSI port
- Optional Ethernet
- 39 fonts

Three interface ports: Appletalk RS-422, IBM PC parallel, and RS-232C.

Jeanne is thrilled that she can print proofs of her company newsletter on tabloid-size paper. No more tiling!



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TOLL-FREE
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Power up with accelerators,

**DO YOU FEEL THE NEED
FOR SPEED? CALL, AND
WE'LL MATCH YOU WITH
THE RIGHT ACCELERATOR.**



APPLIED ENGINEERING

Add the power of a Quadra!
Based on the same (68040) processor as the Quadra.

TransWarp SE (40 MHz w/16-FPU)	\$959
TransWarp LC (25 MHz)	459
TransWarp LC (50 MHz)	1059
TransWarp LC (50 MHz w/50-FPU)	1319
TransWarp 040 (25 MHz)	1749
QuickSilver	189
1.44 SuperPlus Drive	279
QuadraLink	199

DAYSTAR DIGITAL

PowerCache Accelerators

Will make your Mac II, IICx, IIX, IICi, LC or SE/30 run like a Quadra — but without Quadra's fast-mode compatibility problem. Guaranteed 100% compatible with all your utilities and applications.

33 MHz Accelerator	\$529
40 MHz Accelerator	739
50 MHz Accelerator	1065
ComboCache Card for IIsi	209
PowerMath Card for LC	109
Equalizer Card for LC	159
FastCache for Quadra 700, 900 & 950	389

PowerCache Adapter

Provides space on your Mac Classic or SE to install up to 16 Mb of RAM.

PowerCache Adapter	\$40
--------------------------	-------------

FUSION DATA

TokaMac Accelerators

TokaMac's 68040 accelerators provide high-speed performance for the Mac IICi, IIsi, and LC. The same processor used in the Quadras can increase performance up to 300% for graphics and multi-media programs...or up to 600% when you're number-crunching!

TokaMac IICi	\$1259
TokaMac IIsi	1259
TokaMac LC	969



NEWER TECHNOLOGY

Quadra 700 Overdrive Accelerator

Increases performance up to 32%.

Quadra 700 Overdrive	\$259
----------------------------	--------------

Image Magic

DSP board accelerates Adobe Photoshop filters by 200-964%.

Image Magic NuBus	\$769
Image Magic FX/PDS	699
Image Magic Quadra/PDS	699

PERIPHERAL LAND

Quick SCSI Accelerator

A SCSI-2 NuBus host adapter; improves SCSI performance by up to 500%. Partitioning allows a smaller capacity drive to be mirrored into a partition of a larger capacity

drive. SCSI-1 compatible to work with your existing SCSI devices.

Quick SCSI Accelerator	\$339
------------------------------	--------------

RADIUS

Rocket Accelerators

For the Mac II family. The 25 MHz Rocket 25i is powered by a 68LC040 processor. The 25 MHz Rocket and 33 MHz Rocket 33 are powered by a 68040 processor, which has an integrated math-processor. All include: 8 SIMM slots for up to 128 Mb of DRAM; 040 PDS slot; and QuickDraw and display-list acceleration software.

Radius Rocket 25i	\$1239
Radius Rocket	1649
Radius Rocket 33	2069

CARDS AND HUBS

Asanté 10T Hub/8 (Ethernet concentrator)

Lets you use inexpensive unshielded twisted-pair (UTP) telephone wire instead of expensive coaxial cable for local area networks.

10Base-T Hub/8	\$265
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Asanté EN/SC (SCSI-to-Ethernet adapter).

For Macs without available slots.

EN/SC	\$339
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Asanté MacCon 3 Ethernet card. Automatically configures to media used.

MacCon 3 Card	\$216
---------------------	--------------

TechWorks GraceLAN Update Manager

The most advanced tool available for updating/installing software on your network.

GraceLAN for 50 Users	\$285
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100s more networking products available! (There's not enough room to show them all in this ad.)

DaynaPORT E/II-T NuBus Card

Connects Mac II computers to thick, thin, fiber optic or 10Base-T Ethernet cable systems.

Includes an RJ-45 jack for 10Base-T wiring.

DaynaPORT E/II-T NuBus Card	\$149
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DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.

DaynaPORT E/Z	\$269
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Dayna EtherPrint

Supports AppleTalk Phase 1 and Phase 2 protocols; divide your network into multiple zones.

Dayna EtherPrint	\$335
Dayna EtherPrint Plus	439

BRIDGES AND ROUTERS

Cayman

GatorBox CS is the most advanced AppleTalk-Ethernet gateway available... connects an entire LocalTalk network to Ethernet.

The only gateway that can be

upgraded to a file-sharing and UNIX-AppleTalk printer sharing gateway. Two-year warranty.

GatorBox CS	\$2029
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Farallon

PhoneNet Liaison Software Router	\$279
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Ether 10-T Starlet (9-port)	279
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EtherMac Cards (Mac II/LC/SE)	219
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EtherMac Card (Si and SE/30)	259
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Timbuktu 4.02	139
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PhoneNet Star Controller (stand-alone hub)	959
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(24-port)	1389
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PhoneNet Star EN (12-port)	1169
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PhoneNet Card (LocalTalk)	219
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PhoneNet Connector Din-8 (10)	199
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PhoneNet Repeater	369
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Shiva

FastPath 5R Router/Gateway	\$1669
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NetBridge	399
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EtherGate Router	1239
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NetSerial	269
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NetModem/E	1409
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NetModem v.32 (for LocalTalk)	989
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Hublet	229
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LanRover/L	579
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LanRover/E (4-port)	1659
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TeleBridge	399
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If you don't know which networking product will work with your particular setup, give us a call. We can help! Clockwise from bottom: Daria, Jon, Michael, Chuck, James, Ed (a few members of our friendly sales team).

Networking solutions.



PowerBooks, modems & more

Powerful, practical, portable solutions for people on the go.

The PowerBook Duo 210 8/80 and PowerBook Duo 230 8/80 transform into a desktop computer by using the optional Duo Dock. Each PowerBook Duo 210 or 230 includes:

- 640 x 400 Supertwist liquid crystal display with 16 grayscale levels
- 8 Mb of RAM, expandable to 24 Mb
- EverWatch Battery Saver technology
- Optional internal modem

PowerBook® Duo 210 8/80

\$2,529
Lease: \$69/month

25 MHz 68030 microprocessor. 80 Mb hard drive.

All PowerBooks listed here are equipped with a 19mm trackball.

PowerBook® Duo 230 8/80

\$2,889
Lease: \$79/month

33 MHz 68030 microprocessor. FPU, 80 Mb hard drive.

PowerBook Duo 230 with 8/120.....**\$3249**



A PowerBook® 160

\$2,639
Lease: \$72/month

25 MHz 68030. Supertwist display. 40 Mb hard drive.

PowerBook 160 with 8/80**\$2999**
PowerBook 160 with 8/120.....**3359**

Each includes: 8 Mb of RAM, expandable to 14 Mb; display with 16 grayscale levels; 1.4 Mb floppy disk drive.

B PowerBook® 180

\$4,319
Lease: \$118/month

33 MHz 68030 FPU. Active matrix display. 80 Mb hard drive.

PowerBook 180 with 8/120**\$4679**



E Kodak® Diconix 180si Portable Printer

Thermal inkjet printer can print continuous copies for up to 50 minutes. Self-contained ink supply is easy to replace. Kodak Printer**\$379** (w/Mac kit)

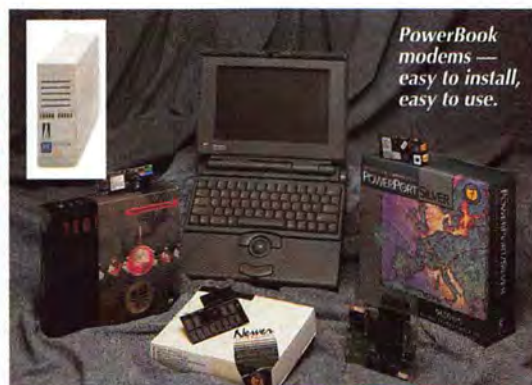
STANDARD MODEMS

Supra 2400 MacPac	\$119
Supra v.32 bis	369
MassMicro FM 24/96 Network	359
MassMicro FM 24/96 Personal	165
Global Village TelePort-Gold	459
Global Village TelePort-Silver.....	399
Global Village TelePort-Bronze	209

Zoom Modems

9600 bps send/receive fax with a Hayes-compatible 2400 bps modem. V.42bis/MNP5 data compression provides high-speed fax and data capability. Group III compatible.

Zoom 2400	\$75
Zoom FX 96/24v.....	149
Zoom 9600 v.32/42 bis.....	259



PowerBook modems — easy to install, easy to use.

Use your PowerBook as a portable and as your desktop computer.

\$449
Lease: \$12/month

F PowerBook Full-Page Display

Flicker-free 15" RealTech portrait display has 870 x 640 resolution, 80 dpi. Vertical refresh rate of 75 Hz. Flat CRT; anti-glare screen. Compatible with PowerBooks 160, 180, Duo Dock and Mini Dock.

PowerBook Memory Upgrades

Newer Technologies

Ultra-low power DRAM design ensures long battery life.

PowerBook 160/180

6 Mb Upgrade.....	\$289
8 Mb Upgrade.....	409
10 Mb Upgrade.....	499

PowerBook 210/230

4 Mb Upgrade.....	\$279
8 Mb Upgrade.....	559
12 Mb Upgrade.....	809

PowerBook Modems

Global Village PowerPort-Gold	\$459
Global Village PowerPort-Silver	399
Global Village PowerPort-Bronze.....	209
PSI Integration	199
PSI 10/42	269
MassMicro FM 24/96 PB	189
Solectek Pocket Fax.....	229
Zoom Pocket Modem	119

POWERBOOK ACCESSORIES

Auto Power Adapter	\$89
Charger/Reconditioner	169
Auxiliary Power Pack	169
Radius PowerView	509
PowerBook Battery	79



PowerBook Carrying Cases

Case G is made of genuine leather; Cases H and I are constructed of 1000 denier cordura nylon fabric and high-density foam, for maximum computer protection.

Leather Attache (G).....	\$139
SuperBrief Double-sided Carryall (H).....	79
Companion Case (I).....	59

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Storage options.



Peripheral Land
21 Mb
Floptical Drive and Syquest
Drives
(shown above)

Storage: 21-212 Mb



MassMicro
21 Mb Floptipak Drive

MassMicro
HitchHiker
80 Drive

MassMicro
120 & 210
Diamond Drives

MassMicro
88 Mb Syquest Drive

MassMicro
Portable Diamond Drive

CONNER

120 Mb Internal/External Drives\$359/449
170 Mb Internal/External Drives399/489
212 Mb Internal/External Drives589/679

PERIPHERAL LAND

21 Mb Infinity Floptical Drive\$359
21 Mb Infinity Flop. (Int-for Quadra)329
44 Mb Turbo Drive549
88 Mb Turbo Drive629
128 Mb 3.5" Magneto-Optical Drive.....1559

QUANTUM

ELS 127 Mb Internal/External\$369/459
ELS 170 Mb External/External419/509

MASS MICROSYSTEMS

21 Mb Floptipak Drive\$459
45 Mb DataPak
Removable Cartridge Drive.....549
88 Mb DataPak Removable
Cartridge Drive659
128 Mb 3.5" DataPak
Magneto-Optical Drive1559
120 Mb DiamondDrive589
210 Mb DiamondDrive729
120 Mb DiamondDrive-1" Portable.....499
210 Mb DiamondDrive-2" Portable.....679
HitchHiker 80.....619

Call for information on the latest
SCSI 2 technology.

Storage: 240 Mb-2 Gb



Peripheral Land
Infinity MaxOptical 1 Gb Drive

Peripheral Land
Infinity Optical
1 Gb Drive

RealTech
Drive
Enclosures
(Call for
price)

Newer Technologies
SCSI II Dart



NEWER TECHNOLOGIES

SCSI II Dart Solid State Storage System.....\$2949

PERIPHERAL LAND

1 Gb MaxOptical 5.25" Erasable Drive\$3539
2 Gb Infinity MiniArray Drive.....\$199

QUANTUM

425 Mb Internal Drive\$1029
520 Mb Internal Drive1285
1.1 Gb Internal Drive1579
1.7 Gb Internal Drive2769

240 Mb Internal/External Drive.....\$619/705
425 Mb Internal/External Drive.....999/1085
525 Mb Internal/External Drive.....1159/1369

**QUALITY
TESTED**

We test all our systems before
shipping them to you. (We even
balance the SCSI bus.)



\$8,739 Quadra 950 with
20" RealTech 24-bit
Trinitron monitor
Lease: \$239/mo.

Macintosh Quadra 950 with 2 Mb of VRAM, 212 Mb
hard drive, RealTech 20" Trinitron monitor, and Key
Tronic MacPro Plus extended keyboard.



\$3,659 Macintosh IIcx with
14" Seiko 8-bit
monitor
Lease: \$99/mo.

Macintosh IIcx, 212 Mb hard drive,
5 Mb of RAM, Seiko 14" monitor,
cache card, and Key Tronic MacPro
Plus extended keyboard.

Our technical team tests all systems
(and all Hardware That Fits products)
before shipping them to you. They're
conscientious, dedicated, and always
willing to go the extra mile. Front row,
left to right: Doug and John.
Back row: Marcus, Mark and Jeremy.



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Call: 1-409-760-2400

Customized solutions.

We help you solve the equation of price, function, and affordability.

Here are only a few of the systems/workstations we sell. We'll let you mix and match your choice of components. And when you do that, there are

100s of custom configurations!



\$10,139

Lease: \$270/month

Quadra 950/Trinitron High-end Graphics Solution

Quadra 950, 8 Mb of RAM, 520 Mb hard drive, RasterOps 20" Trinitron monitor w/RasterOps PaintBoard Li and Key Tronic MacPro Plus extended keyboard.



\$7,849

Lease: \$215/month

Quadra 700/Trinitron Intermediate Graphics Solution

Quadra 700, 8 Mb of RAM, 520 Mb hard drive, RealTech 20" Trinitron monitor w/PaintBoard Li and Key Tronic MacPro Plus extended keyboard.



\$2,729

Lease: \$77/mo.

Macintosh IIsi Solution with 5 Mb of RAM, 120 Mb hard drive, Seiko 14" Trinitron monitor, and Key Tronic MacPro Plus extended keyboard.



\$1,699

Lease: \$47/mo.

Macintosh LC II with 4 Mb of RAM, 40 Mb hard drive, Sony 13" color monitor, and keyboard.



\$4,169

Lease: \$114/month

Macintosh IIfx Business Solution
Macintosh IIfx with 5 Mb of RAM, 212 Mb hard drive, Real-Tech 21" monochrome monitor, cache card, and Key Tronic MacPro Plus extended keyboard.



\$2,509

Lease: \$69/month

Mac IIsi Solution with RealTech Full-Page Grayscale Monitor

Macintosh IIsi with 5 Mb of RAM, 40 Mb hard drive, RealTech 15" full-page monitor, and Key Tronic MacPro Plus extended keyboard.

Your choice of
CPU & HARD DRIVE
+
your choice of
MONITOR
+
your choice of
PERIPHERALS
+
OUR GREAT VALUES
+
OUR GREAT SERVICE
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Gates

For the poker-savvy Gates, the Macintosh was a calculated side bet to hedge against the still-uncertain fortunes of the IBM PC. Although it clearly showed a lot of potential, the IBM machine brought no great technological advances to the party and was certain to draw a raft of me-too competitors. The IBM PC was a step up from the Apple II, but

And then one of Gates's patented last-minute runs to the airport didn't quite work. The Gatesless Microsoft contingent already aboard a flight to Silicon Valley was utterly amazed when the plane reversed and returned to the gate. Somehow the fast-talking Bill Gates had convinced the agents this was a life-and-death matter.

the Macintosh Jobs promised would be a major leap beyond them both. It might not succeed, but if it turned out to be the wave of the future, Microsoft would be there to capitalize on it. By January 1982, the deal with Apple was nearly complete.

And then one of Gates's patented last-minute runs to the airport didn't quite work. The Gatesless Microsoft contingent already aboard a flight to Silicon Valley was utterly amazed when the plane stopped, reversed, and returned to the gate. Somehow the fast-talking Bill Gates had convinced the agents this was a life-and-death matter.

As the flabbergasted Microsofties marveled once again at their chief's leadership talents, Gates stepped aboard and magically reverted to the awkward twelve-year-old nerd. Fumbling with the combination on his briefcase, he couldn't manage to open it and produce his boarding pass. Fortunately, Microsoft software architect Charles Simonyi was having the same problem. The two eventually realized that in the confusion they had swapped their identical cases.

On their return, the team brought home Microsoft's first Mac prototype, a collection of circuit boards in a carrying case. "It was like we were sneaking through the airport," remembered Jeff Harbers, who would shortly become Microsoft's development manager for the Mac. "And we were part of the inner circle of the greatest technological breakthrough that was going to change the world."

In a contract dated January 22, 1982, Apple agreed to supply Microsoft with four prototypes of the Macintosh, which the company would use to produce three software applications: a spreadsheet, a business graphics program, and a database. Left open-ended was the

issue of bundling Microsoft's programs. The agreement gave Jobs a choice: Either include the applications with the machine and pay Microsoft \$5 per program (with a limit of \$1 million per program per year), or sell them separately and pay Microsoft \$10 a copy or 10 percent of the suggested retail price, whichever was greater. But in January 1984, on the eve of the Mac's initial release, the agreement would be rescinded, and Microsoft would end up selling its products itself — at a much greater profit margin.

Wary of Gates using his Mac experience to produce competing software, Jobs dictated in the 1982 agreement that Microsoft could not “undertake in any way to sell, lease, license, publish or otherwise distribute . . . any financial modeling, business graphics or database program which utilizes a mouse or tracking ball for any computer not manufactured by Apple.” The intent was to give the Mac a head start by keeping Microsoft from releasing similar GUI programs for the IBM PC world before the Mac came out. But blinded by his impossible production schedule, Jobs limited the exclusivity clause to twelve months after the earlier of two dates: the initial shipment of the Macintosh or January 1, 1983. Bill Gates would soon take advantage of the fact that Steve Jobs had tripped over his own reality distortion field.

By mid-1983 Jobs knew Apple was heading for trouble. The Apple II was still selling well but had peaked and was losing market share to the IBM PC. The Apple III, plagued by manufacturing defects and a dearth of software, was sputtering along on the road to nowhere. The failing Lisa was so slow it generated a popular “Knock Knock” joke, wherein the response to “Who’s there?” was a

Blinded by his impossible production schedule, Jobs limited the exclusivity clause to twelve months after the earlier of two dates: the initial shipment of the Macintosh or January 1, 1983. Bill Gates would soon take advantage of the fact that Steve Jobs had tripped over his own reality distortion field.

fifteen-second pause, followed by the word *Lisa*. The company had to “bet the ranch on the Macintosh.”

At one point, Jobs tried to give Bill Gates a lesson in business, to convince him that too much of his resources were being squandered on

low-profit operating systems when they'd be better spent on high-profit applications. "It's not that I don't trust you," Jobs added, "but I can't get my people to trust your people, and that makes it hard for us to really give you all the information we'd like to. If your big brother punched my big brother in the nose, people wouldn't say your big brother punched my big brother. They'd say the Gateses are beating up on the Jobses."

"No, Steve," Gates instantly shot back, "I think it's more like we both have this rich neighbor named Xerox, and you broke in to steal the TV set, and you found out I'd been there first, and you said, 'Hey, that's not fair! I wanted to steal the TV set!'"

In June 1984, Gates and systems chief Steve Ballmer cowrote an internal APPLICATIONS STRATEGY memo that articulated unambiguously the depth of the company's commitment to the graphical user interface. The piece had even been written on a Mac:

"Microsoft believes in mouse and graphics as invaluable to the man-machine interface. We will bet on that belief by focusing new development on the two new environments with mouse and graphics . . . Macintosh and Windows.

'Mouse and graphics [are] invaluable to the man-machine interface. Our plan is to implement products first for the Mac and then to port them to Windows. We are taking care in the design of the Windows user interface to make this as easy as possible.'

"This also makes sense from a marketing perspective. Our focus will be on the business user, a customer who can afford the extra hardware expense of a mouse and high-resolution screen and who will pay premium prices for quality easy-to-learn software Our plan is to implement products first for the Mac and then to port them to Windows. We are taking care in the design of the Windows user interface to make this as easy as possible."

There it was: Gates was betting the company on GUIs. He wanted Microsoft products to be "the standard" and intended to "achieve very high market share on the Mac." Contrary to anything Steve Jobs might think, the Mac was no side bet for Bill Gates.

Neither was Windows. According to the June memo, "it goes far

beyond Mac in several areas, including support for multiple active applications and variable resolution. Over time Windows systems will dominate, since they will have more software than any other. It is crucial to our future to establish Windows as THE STANDARD graphics interface for microprocessor software development by the end of 1984.”

Bill would spontaneously leap in the air and try to touch the ceiling. A colleague once found Bill bouncing on a minitrampoline in Microsoft's lobby and warned him that he might hit his head. 'I can hit my head if I want to,' Bill said without missing a beat. 'It's my company!'

Bill Gates had a reality distortion field of his own. The first version of Windows would not be released until the end of 1985. It would not become any sort of a standard until five years later.

Every world-class poker player knows that the one thing you can never control is the element of chance — no matter how hard you try. But you'll stay at the table longer if you can maintain your perspective — and keep your sense of humor.

“Do you ever wish you were back programming on your own again?” Gates had been asked for a Microsoft Press book. “Oh, sure, absolutely,” he had replied. “Then you control everything. There's no compromise.”

Walking down the hallway or during a slow spot in a meeting, Bill would spontaneously leap in the air and try to touch the ceiling. A colleague once found Bill bouncing on a minitrampoline in Microsoft's lobby and warned him to be careful or he might hit his head. “I can hit my head if I want to,” Bill said without missing a beat. “It's my company!”

Stephen Manes has written about computers for ten years as a columnist for *PC Magazine*, *PC/Computing*, and *PC Sources* and has written more than 30 books, including *The Complete MCI Mail Handbook*. Paul Andrews is high-tech reporter for the *Seattle Times*, where his computer column, *User Friendly*, appears.

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Internal Model	Genesis 650i	none	none	none
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Access Time	40ms	95ms	37ms	35ms
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CIRCLE 160 ON READER SERVICE CARD.

THE MACUSER

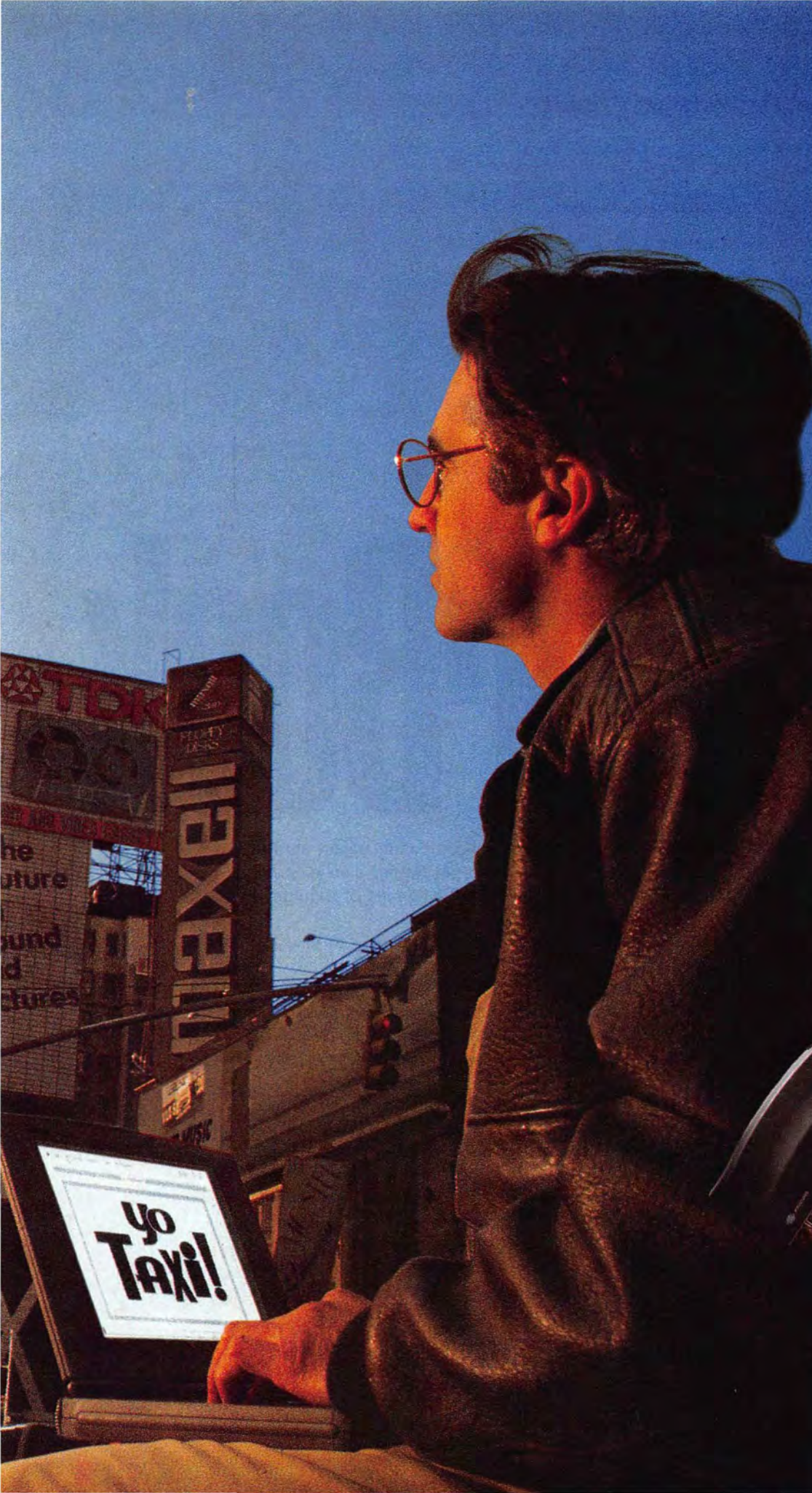
PowerBook Primer



he year 1992 will be remembered for many things, but for Mac users, it will always be the Year of the PowerBook. We watched with mingled pride and awe as the first true Macintosh notebook computers swept through the market, with 400,000 units sold and Apple being instantly catapulted into a leadership position.

In this guide, *MacUser's* editors report on the current PowerBook state of the art in comparative features of key technologies such as 2.5-inch hard drives and PowerBook batteries. (Believe it or not, this is the first empirical testing of PowerBook batteries and examination of power-consumption issues we've seen anywhere. ZD Labs' discoveries may change the way you work.) In addition, we've taken another look at external video-display adapters and assembled a collection of what our PowerBook-savvy editors believe are the most important tips and techniques. For those of you who haven't found an excuse to buy a PowerBook yet (or who are ready to trade up to one of the newer models), we help you answer the question: Which PowerBook should I buy? And finally, for those who are never satisfied with Apple's offerings, we present the most powerful, expensive, precocious, and preposterous PowerBook of all: *MacUser's* UltraBook.





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Apple's notebook-computing ranks have more than doubled in the past few months. Here are the pros and cons of each PowerBook model — one of them will meet your needs.

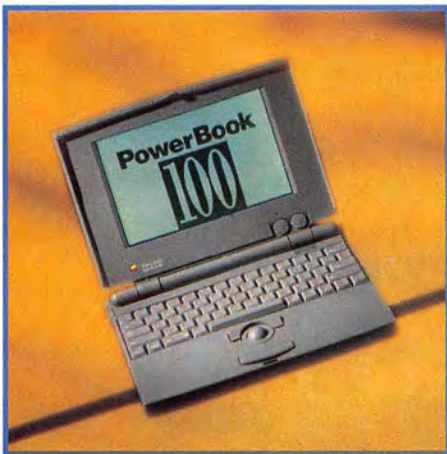
PICKING A **PowerBook**

Remember when portable-Macintosh computing meant stuffing your 25-pound SE into a carrying case, positioning it on your right hip, leaning about 15 degrees to the left, and kind of swinging it along as you walked?

Then there was the Great Leap Forward (apologies to Mao Tse-tung): the Macintosh Portable. It weighed only 16 pounds — a major improvement. The gymnastic routine for that model was much simpler: You carried the Portable in one hand and, to create a sense of balance, an equally heavy briefcase or suitcase in the other. It was a great upper-arm workout for executives too busy to exercise.

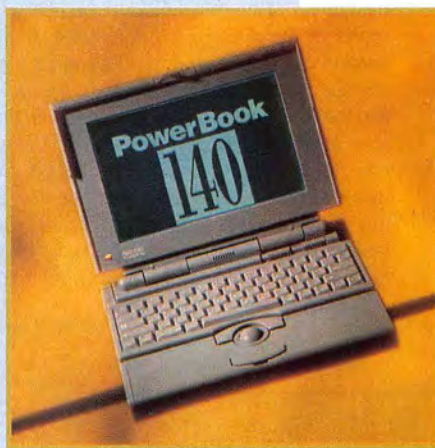
Today your choices are both more extensive and more rational. They are called PowerBooks. Apple's PowerBook line is not only the best-selling line of Macs the company has ever produced but it is also the best-selling line of notebook computers in the entire personal-computer market. You can choose among PowerBooks that range from the under-\$700 PowerBook 100 2/20 (no longer sold by Apple but still available — if you can find it — at the Price Club); to the dockable Duos; to the top-of-the-line PowerBook 180, which, despite its \$4,000-plus price tag, is selling like hotcakes. But now that you have a choice, how *do* you decide?

BY HENRY BORTMAN



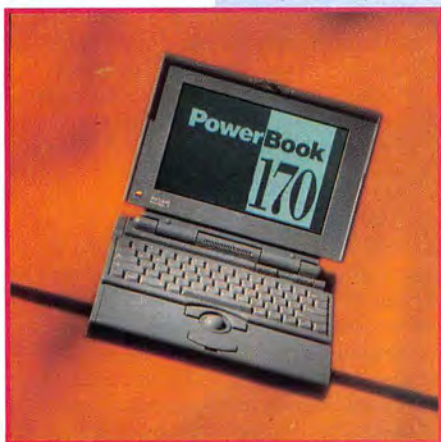
POWERBOOK 100

Now discontinued, the PowerBook 100 is still many users' favorite model. It weighs only 5.1 pounds, but it has no built-in floppy drive and the performance of its 16-megahertz 68000 processor is roughly equal to that of Apple's entry-level Classic II. It was not a great commercial success at \$2,229 (without an external floppy drive), which is why a lot of lucky bargain hunters were able to pick one up at discount outlets such as the Price Club or Whole Earth Access for less than \$700 (with an external floppy drive costing about \$200). All the 100s may be sold by the time you read this, but it's a great buy for those who want maximum portability but don't need maximum power.



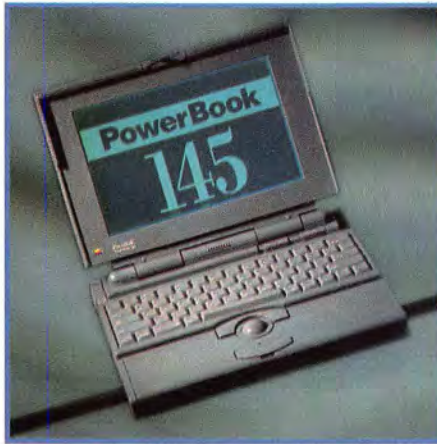
POWERBOOK 140

These models too are now discontinued and generally no longer available. The 140 has been replaced by the 145, and the 170's successors are the 160 and the 180. Because Apple offers no trade-up from the 140 and the 170 to their replacements, there's a good chance that they'll be available on the used market. For those who can get a good price (and who aren't interested in the bells and whistles of the newer models), the 140 and 170 are still attractive machines — especially the 170, with its active-matrix LCD display.



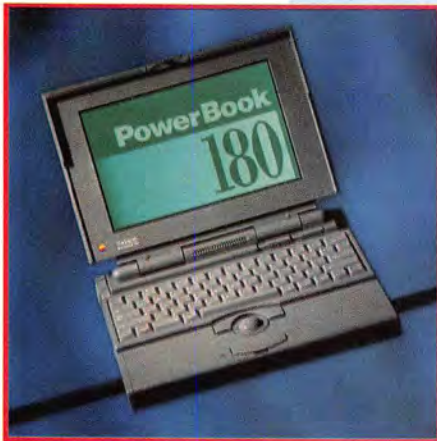
POWERBOOK 170

Picking a PowerBook



POWERBOOK 145

The 145 (\$2,149 with a 40-megabyte hard-disk drive, \$2,499 with an 80-megabyte drive) is the only holdout from the original round of PowerBook products. An upgraded version of the 140, the 145 contains the same 25-megahertz 68030 processor as the 160 and, like the 160 and the 180, has a built-in floppy-disk drive. However, unlike the 160, the 145 has no video-out port, it can't be connected directly to the SCSI chain of another Mac, and it has only a monochrome (1-bit) display. So unless you find a fantastic deal, consider carefully before you buy: You can probably get a 160 for only \$300 more.



POWERBOOK 180

The top-of-the-line 180, like the 160, has video-out capability and a built-in floppy drive and weighs 6.8 pounds. It is more powerful than the 160; its 68030 processor has a clock speed of 33 megahertz. It outperforms the venerable IIfx, which contains a 25-megahertz 68030. The 180's most outstanding feature — available only on the 180 — is its stunning active-matrix LCD screen, which can display as many as 16 shades of gray.

The 180 is the executive's PowerBook, for users who don't want to compromise on power and who are willing to pay a bit of a premium. With an 80-megabyte hard drive, the 180 retails for \$4,109; with a 120-megabyte drive, it sells for \$4,469.



POWERBOOK 160

The 6.8-pound 160 comes with 4 megabytes of RAM (expandable to 14 megabytes) and a 40-, 80-, or 120-megabyte hard drive (priced at \$2,429, \$2,789, and \$3,149, respectively). Its passive-matrix screen is capable of displaying 16 shades of gray, and the computer provides a video-out port to which you can attach a variety of external monitors and displays that can reproduce your work in as many as 256 colors or shades of gray. The 160 is a good choice for mobile professionals who need to work on the run and whose work includes giving presentations at customer sites.

The Duos are the most innovative additions to the PowerBook family. They are the first dockable PowerBooks, doubling as both portable and desktop computers. They weigh a scant 4.2 pounds — nearly a full pound less than the original PowerBook 100 — which makes them the most portable Mac portables to date. Undocked, however, they provide only modem and LocalTalk outputs and contain no floppy drive. If you want the additional connections, you need to dock your Duo.

Apple offers two docks: the Duo Dock and the Duo MiniDock. The Duo Dock (\$1,079) lets you use your Duo as a fully powered desktop Mac. It contains a floppy-disk drive, space for a 3.5-inch hard-disk drive, two NuBus slots, video RAM to support as many as 256 colors on 16-inch and smaller monitors, and a full set of standard Mac connectors. The MiniDock (\$589) can be used either on a desktop or for travel. It provides a PowerBook Duo with a full set of input and output connections — SCSI, video-out, serial (modem and LocalTalk), floppy-disk-drive, sound-in and -out, and ADB — but doesn't offer the same internal-expansion options that the Duo Dock does. Several third parties are also selling travel docks for the Duos, some providing support for larger color monitors, others for Ethernet connectivity.

As for the PowerBook Duos themselves, the 210 and the 230 contain passive-matrix displays capable of displaying as many as 16 shades of gray. They use NiH₂ (nickel hydride) batteries, which Apple claims can power as many as 4.5 hours of continuous use. The only differences between the 210 and the 230 are their processors and their prices: The 210, which contains a 25-megahertz 68030, lists at \$2,249 with an 80-megabyte hard drive; the 230, whose 68030 processor runs at 33



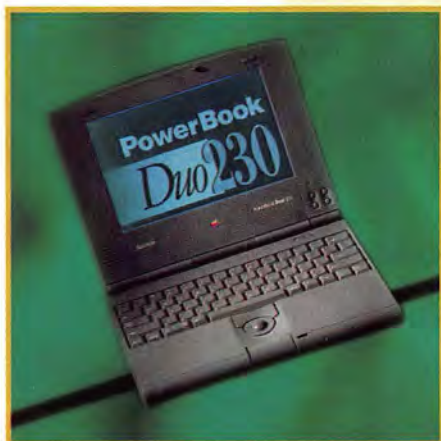
POWERBOOK DUO 210

megahertz, retails for \$2,609 with an 80-megabyte drive and \$2,969 with a 120-megabyte drive.

Is a Duo for you? If you want a portable Mac but your company's bean counters won't let you purchase both a PowerBook and a desktop machine, the answer is probably yes. If, however, you use your floppy drive frequently and will just end up

carrying it around all the time anyway, you might want to go for a 160 or a 180 instead. There are ways to dock a 160 or a 180

and use it as a desktop machine, albeit ways that are less elegant than those of the Duos. And make sure you do your math before you buy: A PowerBook Duo 230 configured with an 80-megabyte drive, a Duo Dock (for the office), and a MiniDock and an external floppy drive (for home and travel) costs almost as much as an 80-megabyte 68040-based Quadra 700. But then, you can't put a Quadra into your briefcase. ☹



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CIRCLE 62 ON READER SERVICE CARD.

THE MacUser *Ultra*BOOK

BY HENRY BORTMAN

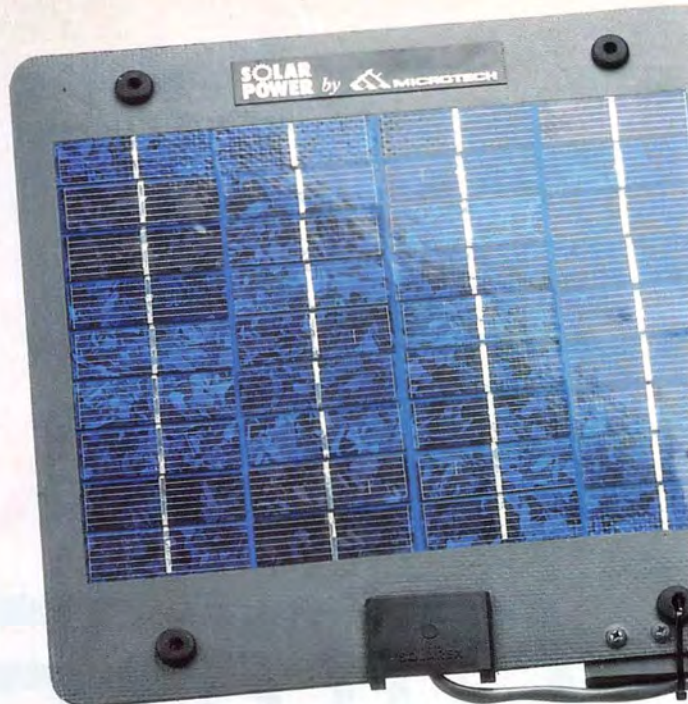
*You can build
the PowerBook
of tomorrow
with today's
technology — if
you don't mind
spending a few
kilobucks.*

S*ome people are never satisfied.*

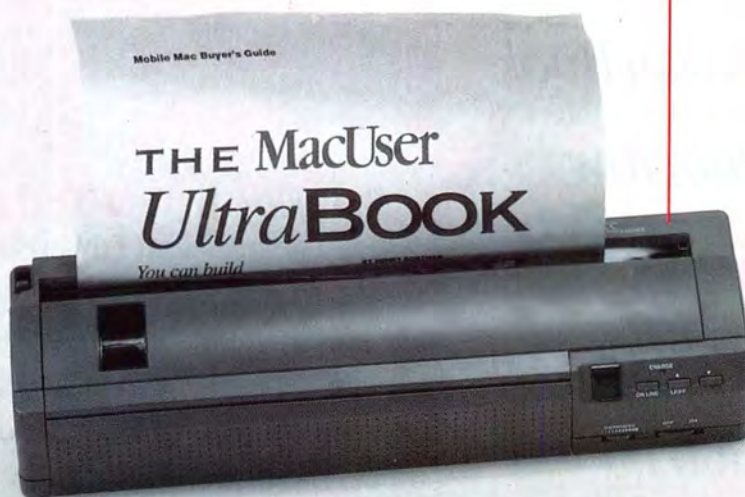
There's no question: PowerBooks are the most successful Macs Apple has ever built. It's been only a year since their introduction, and already the first year's models are obsolete. Today's second-generation PowerBooks sport faster processors, gray-scale displays, and 8-bit video output. The PowerBook Duos even offer dockability (see "The Convertible Mac: The Macintosh Duo System," December '92, page 144).

But clearly, although Apple is doing some things right, there is still plenty left to do. Otherwise, why would hardware manufacturers be rushing to market with high-speed internal fax modems; increasingly high-capacity 2.5-inch disk drives, both internal and external; security devices; RAM upgrades; longer-life batteries; conditioning battery chargers; and portable printers? People buy these things because they want their PowerBooks to be more Powerful.

Figure 1: MacUser's Macintosh UltraBook is a top-of-the-line PowerBook 180 that's been customized with as many cool and incredible upgrades as we could cram into the case. Money was no object, as you'll see if you add up the total.



GCC's WriteMove II: portable, battery-powered, 360-dpi printer (\$599).



Dayna's DaynaPORT SCSI/Link-3: SCSI Ethernet interface (\$499).

Norris' EarPhone: combination earphone and microphone (slated for bundling with the DataLink PB).



Photonics' Collaborative Mac: diffuse-infrared LocalTalk transceiver (\$250).



SonicPro's PowerBook alarm: motion detector/security alarm (\$99.95).

Microtech's SolarPOWER:
solar-panel battery charger
(\$189).

Newer Technology's PaletteBook:
8-bit-color, active-matrix display
(\$3,495).

Apple's PowerBook 180 4/80
(\$4,109).

Applied Engineering's DataLink PB:
14.4-Kbps voice/data/fax modem
(\$619).

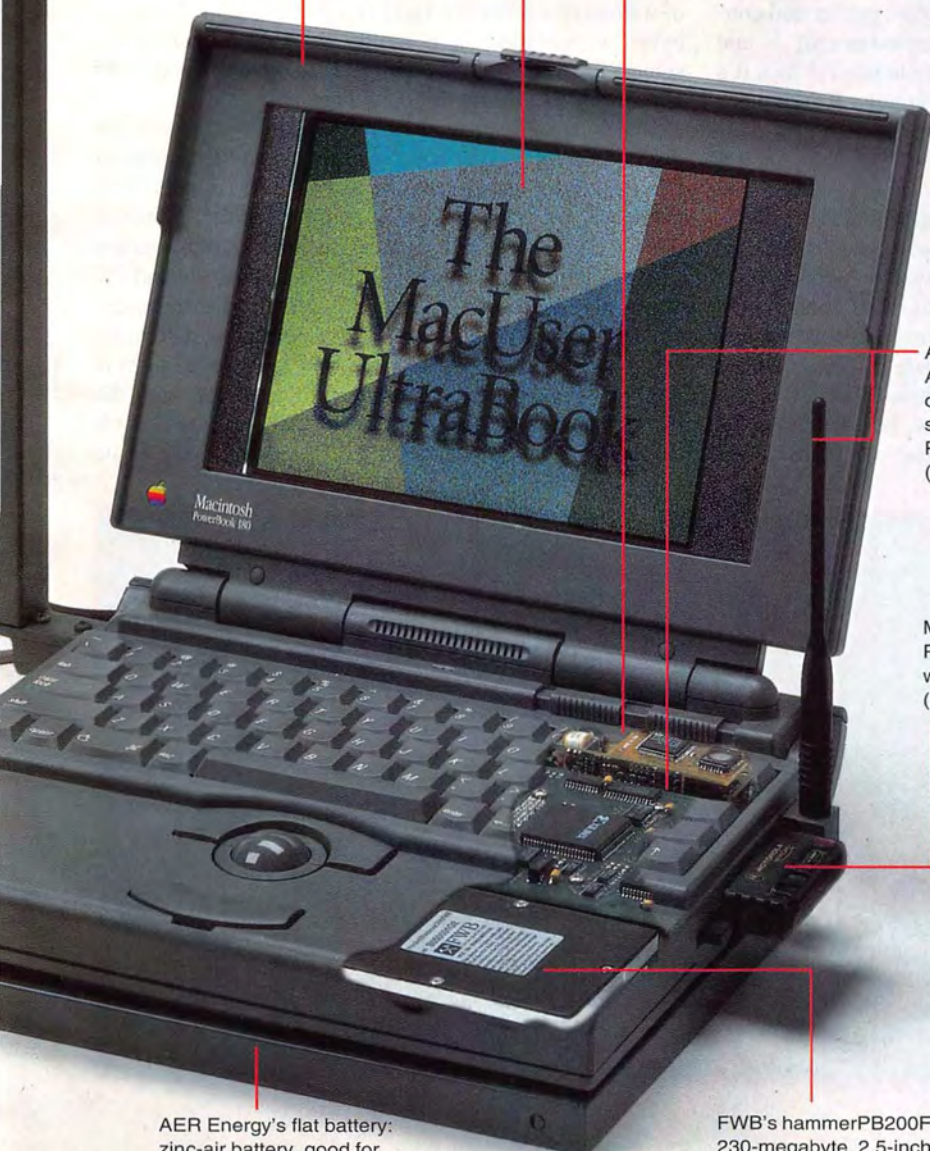
Floppy-disk drive:
installed in an
external case by
Applied Engineering
as part of the
AErport installation
(no additional charge).

Applied Engineering's
AErport: internal
cellular-phone, spread-
spectrum-radio, and
PCMCIA interfaces
(\$2,499).

Motorola's NewsCard:
PCMCIA-based
wireless data modem
(less than \$400).

AER Energy's flat battery:
zinc-air battery, good for
8 to 10 hours per charge
(\$450).

FWB's hammerPB200FMF
230-megabyte, 2.5-inch
internal disk drive (\$1,279).



The MacUser UltraBook

So, being the hard-to-please types ourselves, we decided to go shopping for the whizziest PowerBook hardware upgrades money can buy. Our goal was to make the world's Most Powerful PowerBook, regardless of the price.

The result: *MacUser's* Macintosh UltraBook (see Figure 1).

Although the UltraBook may seem like a mobile-computer-user's fantasy, it is no pie-in-the-sky marketing sketch. All the hardware we installed in the UltraBook is either shipping or — if the prototypes pan out — soon will be, a testament to the expandability of the PowerBook line. Moreover, although the capabilities we added to our PowerBook 180 to convert it into the UltraBook are prohibitively expensive today, many of them are already close to becoming mainstream. And others are likely to become so, sooner or later — perhaps even real soon.

No, we're not preannouncing any Apple products. We're just looking at the trend in computer hardware — which is unequivocally toward packing ever more power and connectivity into ever less space for ever lower cost — and speculating. Mobile computing is here to stay; in fact, it's just about the only segment of the computer marketplace that is experiencing strong growth.

Building the Basics

To create the UltraBook, we started with a PowerBook 180 4/80 (\$4,109 list). The choice was an obvious one: It is Apple's current top-of-the-line PowerBook model. Although the dockable PowerBook Duo 230 contains the same type of 33-megahertz 68030 processor as the 180 does, the 180's larger form factor made it a better choice for UltraBook expandability. Apple also sells a 180 model with a 120-megabyte hard-disk drive, but we chose the minimal-configuration model, because our plans called for replacing the Apple drive anyway.

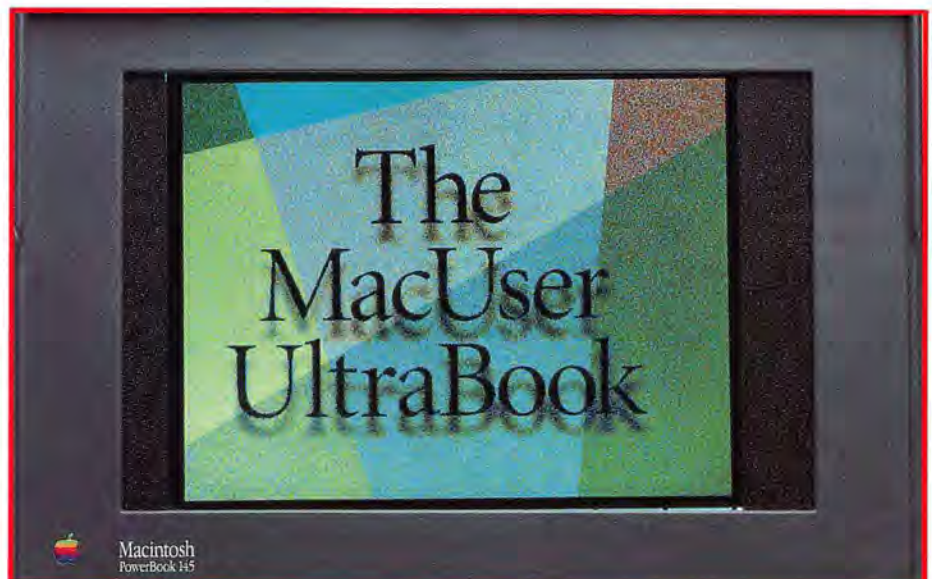
And so, replace it we did — with FWB's hammerPB200FMF, a 230-megabyte, 2.5-inch, low-power-consumption internal drive (APS and MicroNet also plan to market similar drives for internal PowerBook use). The capacity of 230 megabytes is nearly double that of the largest drive that Apple offers (120 megabytes) and is significantly higher capacity than the highest-capacity 2.5-inch drive offered by Quantum (160 megabytes). The hammerPB200FMF is

expected to carry a price tag of \$1,279.

The next thing we decided to improve on was the RAM configuration. Although PowerBook 180s can support 14 megabytes of RAM, Apple ships them with only 4. So we needed an extra 10 megs. But, not wanting to limit our use of the RAM-expansion slot by installing RAM only, we gave a call to Newer Technology, which, in conjunction with Computer Care, has developed one of the world's most expensive PowerBook upgrades, the PaletteBook (\$3,495).

The PaletteBook is an 8-bit active-matrix color LCD panel that can be installed in place of a PowerBook's screen. It is driven by a video-display adapter, a circuit board that fits into the PowerBook's RAM-expansion slot. The adapter contains the video-display circuitry on one side and system-RAM-expansion chips on the other. Although, at press time, Newer was developing a prototype of the adapter that could bring the total RAM complement of a PowerBook 160 or 180 to its maximum of 14 megabytes, we installed the currently shipping model — designed for the 140, 145, and 170 — which brought the UltraBook's RAM up to only 8 megabytes.

One interesting feature of the PaletteBook is that the display's resolution is 640 x 480 pixels, not the standard PowerBook-display resolution of 640 x 400 pixels. (This is imposed on Mac users by the dominance of PC clones in the notebook-computer market. Because PC screens are standardized on a resolution of 640 x 480 pixels and PC notebook computers generate the demand for the overwhelming majority of color LCD displays, that resolution is the only one available for now.) The advantage of this is that you get more information on your screen with the PaletteBook than you do with a standard PowerBook display. The disadvantage is that the pixels have to be



packed more densely — 94 dpi, instead of the standard 72 — to fit into the PowerBook's fold-down lid. The PaletteBook has such a crisp and bright display, however, that even small-point-size text is quite readable (see Figure 2), despite this higher pixel density.

Taking to the Airwaves

With a color display and all the RAM and disk-storage space we could squeeze into our UltraBook safely installed, we were ready for some serious connectivity. Apple markets an internal modem for the 180, capable of 14.4-Kbps data transmission and 9,600-bps fax send/receive. But fax/data modems are a dime a dozen these days. The UltraBook deserved better. And Applied Engineering provided it, in the form of a DataLink PB (\$619), a modem that enables not only fax and data communications but voice communications as well.

Bundled with the Norris EarPhone — more on that in a moment — and CommPhone software, the DataLink PB turns your PowerBook into a complete telecommunications center. The modem itself contains a voice chip that in conjunction with the CommPhone software enables you to use your PowerBook as a telephone, a speakerphone, and an answering machine, all rolled into one (see Figure 3).

By double-clicking on a phone number that you've stored in CommPhone's address book, you can get your PowerBook to dial a call. If you want the PowerBook to be a speakerphone, you can use its built-in speaker and microphone (the microphone is built in on the 160, 180, and Duos; it's external on the 140, 145, and 170). Alternatively, you can use the Norris EarPhone, which Applied Engineering is planning to bundle with the DataLink PB, for private telephone conversations. The EarPhone combines a microphone and an earphone into a single device that fits in your ear. (The microphone works by picking up vibrations from your eardrum when you talk. Not only is this compact and unobtrusive but it also eliminates the problem of ambient noise in crowded locations.)

CommPhone also includes software for using your PowerBook as an answering machine. Outgoing and incoming messages are stored in compressed form on your PowerBook's hard disk. And you can tailor specific outgoing messages for individual callers, using either caller ID (in states where it's available) or your own custom ID numbers, which you can give to

people who call you frequently and for whom you might want to craft personal outgoing messages.

Of course, with all this communications capability, you'd want to be able to send and receive voice, data, and fax calls anytime, anywhere. You certainly wouldn't want to be limited to those rare times in your life on the run when you happened to be near a standard (RJ-11) telephone jack to plug your modem in to — which is why we also installed an Applied Engineering AErport into our UltraBook. The simplest way of describing the AErport is that it's an internal cellular phone for the PowerBook. But that's only a third of what it's designed to be used for. When Applied Engineering says that it wants you connected, it doesn't fool around.

AErport actually comprises three distinct parts, all integrated via a communications microcontroller. The cellular RF interface is one part. Think of it as the radio-transceiver portion of a cellular phone. The rest of the phone functionality comes from the DataLink PB and its CommPhone software, which must be installed for the cellular AErport link to work. The second segment of the AErport is an interface into which a spread-spectrum radio transceiver can be plugged. Spread-spectrum technology is typically used for wireless LANs and remote control of computing devices. Finally, the AErport contains a PCMCIA-card slot. The PCMCIA-card interface is a versatile standard widely supported in the computer industry for adding functionality to computers, with credit-card-sized modules that can be inserted and removed on the fly. It can be used for RAM-based disk drives, modems of various types, wireless network connections, and more. Applied Engineering intends it to be used for adding modules that will let users access satellite-based data networks such as ARDIS and RAM Mobile Data.

And what good is a PCMCIA interface without a PCMCIA card to put in it? So we got in touch with our friends at Motorola, who had just announced the NewsCard, a less-than-\$400 pagerlike device that can be used to receive messages from various paging-service providers, such as Embarc and SkyTel. The really cool part is that the NewsCard, which has its own battery and antenna — that's right, the UltraBook has *two* antennas — can receive messages even when it's not inserted in a computer. It stores them in a buffer, and when you insert the NewsCard into the AErport PCMCIA slot or into any other device with a PCMCIA slot, you can access the stored messages by using software installed on your computer. Look for the NewsCard to ship in the second quarter of 1993.

We should mention, for the record, that the AErport has a disadvantage: If you want to install it inside your PowerBook, you have to remove the floppy-disk drive. Sorry, but the AErport has to go somewhere, and there isn't a whole lot of extra room inside a PowerBook. Applied Engineering will install your floppy drive in an external case as part of the AErport installation process,

Figure 2: The Applied Engineering PaletteBook is an 8-bit active-matrix color LCD display, with pixel dimensions of 640 x 480 and a resolution of 94 dpi. It can be installed in place of the monochrome or gray-scale display in a PowerBook 140, 145, or 170. At press time, Applied Engineering was working on a similar product for the 160 and the 180.

The MacUser UltraBook

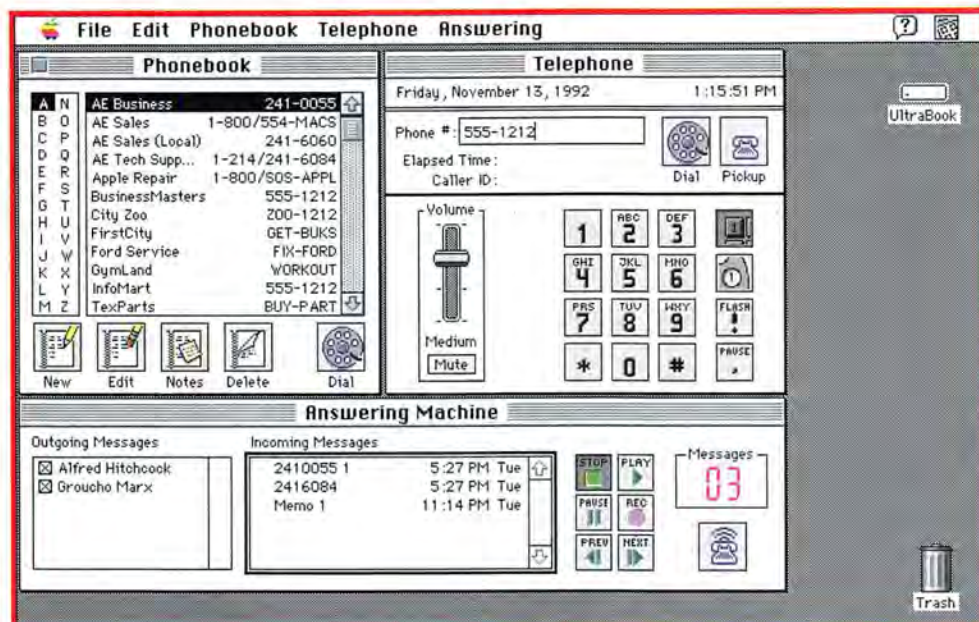


Figure 3: The CommPhone software, which ships with Applied Engineering's DataLink PB modem, lets you use your PowerBook as a telephone, a speakerphone, and an answering machine. Using caller ID (in states where it's available) or your own private ID codes for people who call you frequently, you can tailor outgoing answering machine messages for individual callers.

though. Alternatively, you can get the AErport installed in an external-floppy-drive-sized case, outside the PowerBook, and leave your floppy drive where it started. It's up to you. Either way, the AErport will set you back around \$2,499 — not for the faint of heart.

But we weren't done with connectivity options when we were done with Applied Engineering. We still didn't have an infrared network connection. So we drove down to San Jose to visit Photonics, which dabbles in such things. And — wonder of wonders — the first external diffuse-infrared transceivers for the Mac, called Collaborative Macs, were just rolling off the assembly line. Just 250 bucks a pop. So we picked one up.

Infrared network connections use invisible light waves, instead of wires, to carry network signals between devices. Diffuse-infrared transmitters send light waves out in all directions, so that a receiver within a certain radius of the signal — about 30 feet in this case — can pick it up. The Collaborative Mac is an external, tethered transceiver. English translation: It's a little square gizmo with a round piece of red plastic in the middle, stuck on the end of a cord that plugs in to your Mac's LocalTalk (printer) port and that is capable of sending and receiving infrared signals. You and another Mac user who also has a Collaborative Mac transceiver can create an instant LocalTalk network between you just by walking into the same room and turning on the two Macs.

But we didn't want to get so busy making sure we could make any required wireless connections that we forgot to empower ourselves to do wires too. So we snagged a couple of Farallon StarConnectors (\$29.95 each) and a 6-foot-long standard telephone wire (the kind you use to plug in your kitchen phone), for making a LocalTalk

connection the old-fashioned way, just in case we met up with someone who didn't have a Collaborative Mac infrared transceiver.

Still, something was missing: Ethernet connectivity. After a bit of shopping around, we found that Dayna had the smallest, lightest SCSI Ethernet interface available for the Mac, the DaynaPORT SCSI/Link-3 (\$499). So we got one of those too. After all, we didn't want to get caught with only LocalTalk capability at some big company where absolutely *everyone* is on Ethernet. In addition to being compact, the SCSI/Link-3 has a complete set of Ethernet-connector options: thicknet, thinnet, and 10BASE-T.

As you might suspect, when we had finished adding all this hardware to our UltraBook, we were drawing a bit more power than average PowerBook users do, even those who leave their hard disks perpetually spinning and their backlights turned up to maximum. In fact, we have to caution you: We don't recommend that you attempt to install all this hardware simultaneously in a PowerBook, even if you can afford it. It might be a good way to keep your hands warm in the winter, but even if your PowerBook is still under warranty, we suspect that Apple wouldn't rush you a free replacement if your computer's logic board had a brownout because you exceeded the PowerBook's recommended power-draw limit.

Still, having built the UltraBook, we did want to use it. And because it was supposed to be a mobile device, we wanted to run it off a battery. It was obvious we had to find something better than the three-hours-if-you're-really-lucky NiCads Apple sells. And we did. In the form of a zinc-air battery, from AER Energy. Although Apple is no doubt at this very moment figuring out how to support zinc-air batteries in its future PowerBooks — AER claims the

Double Your Disk Space Without Compressing Files.



If you've got a hard disk bursting at the seams, you need TimesTwo.* It's new from Golden Triangle and it's the most sensible solution for doubling the capacity of your disk without cramming and stuffing files into limited space. Your PowerBook's 40 MB disk becomes 80 MB instantly. Your Ilci's 80 MB disk swells to 160 MB. Without



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TimesTwo is fully compatible with all Macintosh applications, including file recovery programs like Norton Utilities and MacTools. It works with any SCSI hard disk including SyQuest, Bernoulli and erasable optical disks. You can even double an 88 MB SyQuest cartridge to 176 MB and use it on a Mac that doesn't have TimesTwo installed.

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The MacUser UltraBook

energy density, or power per pound, of zinc-air batteries is several times that of NiCad batteries — for the UltraBook we had to settle for AER Energy's prototype flat battery.

For \$595, AER Energy sells a 20-hour battery, the Power 20, which weighs around six pounds and comes in a stand-alone unit that takes up a fair amount of desktop (or airplane tray-table) space. We chose instead a prototype of AER's flat battery (expected retail price: \$450). Although it provides only (!) eight to ten hours of charge, it is lighter and more compact: It's around half an inch high and is the same length and width as the PowerBook, which it fits under, so it has a zero footprint; and it weighs a mere three pounds.

It's always good to have a backup plan, so we decided the UltraBook should have a standard PowerBook NiCad battery as well. And just in case we needed to squeeze a little more running time out of the NiCad, we added one more extra: Microtech's SolarPOWER solar-cell charging panel (\$189). The SolarPOWER panel attaches to the bottom of the PowerBook case. It folds down for travel, and up and out to the side when in use, to catch a few rays and convert them into usable energy. Even on a bright day, the SolarPOWER panel doesn't put out enough juice to keep the battery from eventually running down in a standard-configuration PowerBook, let alone an UltraBook. But Microtech claims that it can extend the running time you get from a single charge of your NiCad battery by as much as 50 percent.

And then there's printing. With practically every type of network connection known to computerdom — both wired and wireless — already a part of the UltraBook, you might think we had at last achieved paperless communication. But being in the magazine business, we realize that sometimes people do need to see a real-life printed page. So we included a printer — the 360-dpi WriteMove II, from GCC — in the UltraBook setup. Reasonably priced (\$599), powered by its own rechargeable NiCad battery, and with output quality rivaling that of the Apple StyleWriter and the HP DeskWriter, it was the only printer that would fit in our travel case after we had crammed in all the other UltraBook hardware.



Figure 4: InCom America's Compu-Case Executive was able to accommodate the UltraBook and all of its external accessories and AC adapters. Total weight: 23 pounds, a pound and a half less than the original Macintosh Portable (with carrying case, AC adapter, and an extra battery).

And speaking of the case, we examined several before we found one that could carry all of the UltraBook's gear: the UltraBook itself, the floppy drive in its Applied Engineering-supplied external case, the SCSI Ethernet interface (with AC adapter), the AER battery and its charger, the SolarPOWER panel, and the WriteMove II printer and its charger. We chose the Compu-Case Executive (\$229), from InCom America, a briefcase-sized case with a flexible arrangement of pockets, nooks, and crannies. Using a shoehorn or two, we managed to make it all fit (see Figure 4).

But we still weren't quite finished. If you've been counting, our total cost so far is around \$14,676.90.

Now, I don't know about you, but I get nervous leaving my \$3,000 PowerBook 170 unattended for more than a few seconds at a time. I certainly wouldn't want to go out in public carrying an UltraBook without some type of physical security to increase my chance of going back home with it still in hand. So the final touch on our UltraBook masterpiece was a SonicPro PowerBook alarm (\$99.95). Think of it as a car alarm for your computer, because that's just how it behaves. It's a programmable motion detector with the ability to make a very loud noise when moved. The motion sensitivity can be adjusted so that you can move the PowerBook without setting off the alarm, and you can also set the duration of the audible screech.

That brought the total price of our UltraBook to \$14,776.85 (plus tax). With that much money, you could buy yourself three PowerBook 180s and still have enough left over for a round-trip airfare to Europe. But who would want to schlep three PowerBooks around Europe? Not only would it be far less cool than being seen with an UltraBook but it would also weigh more.

Which reminds us, when we were finished, we did weigh the UltraBook, nestled in its carrying case with all of its accessories. The damage: 23 pounds — a pound and a half less than the original Macintosh Portable (with its AC adapter, an extra battery, and Apple's carrying case). We'd say that qualifies as progress. ☺

Henry Bortman is *MacUser's* technical director and would like to hear your suggestions for additions to the UltraBook.

POWER TRIP



At the office, in the air, at home, or on the road, you want high-powered PowerBook solutions to get the most out of your portable computing. TechWorks' **PowerRAM™** Memory and **Spiral™** note taking software are the perfect companions for Macs on the go.



TechWorks' PowerRAM Upgrades are available for the PowerBook 100, 140, 145, 160, 170, 180 and Duos in configurations from 2MB up to 20MB. A free installation guide steps you through the entire install.

Spiral makes it easier than ever to keep information organized while you're on the move. Spiral is an easy-to-use note taking application designed for the PowerBook users' unique demands. Spiral is great for taking notes at meetings, organizing **CIRCLE 104 ON READER SERVICE CARD.**

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client presentations, cataloging information, and more. Spiral's built-in **battery conservation** features let you use your PowerBook for hours with no need to recharge. Spiral offers other PowerBook Friendly™ options like a large I-beam cursor and on-screen battery charge indicator.

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THE
PowerBook
SURVIVAL GUIDE

A

BY JAMES BRADBURY

*It's a jungle
out there. Before
you take your
PowerBook out
in the field, check
these tips from
the MacUser
editors.*

fter shouldering PowerBooks all over the country, from Redmond to Miami, *MacUser's* editors have learned plenty about how to coax the most productivity out of everyone's favorite notebook computers. The following tips — on batteries, power management, and travel — distill the most important lessons we've learned during the first year of the PowerBook.



The PowerBook Survival Guide

BATTERIES

PowerBook owners are obsessed with batteries — with good reason. Apple claims that its NiCad batteries, which power all PowerBooks except the 100 and the Duos, last two and a half to three hours, but anyone who's used them in the field knows that's wildly optimistic — unless you know what you're doing. Many less seasoned users report getting one to one and a half hours. And with batteries priced at \$69, loading up on them gets expensive (not to mention heavy). So here's what you need to know about the care and feeding of batteries. Together with proper power management, following these rules will keep you running as long as possible without having to plug in.

Condition your batteries.

All NiCad PowerBook batteries should be completely discharged at least once a month to maintain their maximum charging capacity. Just leave the machine on and ignore all the power warnings it gives you until it puts itself to sleep. You can bring on nap time more quickly by turning your backlight all the way up, setting your hard drive to the maximum amount of time before spindown, and choosing the fastest processor speed possible. Connectix's CPU utility package has a special Quick Discharge setting that drains the battery at the fastest possible rate.

Recharge all your batteries right before taking a trip.

Charging your batteries and then storing them in a carrying case isn't a good idea, because (except for the PowerBook 100's lead-acid batteries) PowerBook batteries gradually lose their charge if they just sit around. We recommend that you invest in a battery charger — that way you can give batteries an overnight charge right before

you leave on a trip. Better yet, get in the habit of leaving batteries in a charger after you've conditioned them. That way, they'll always be ready when you need them. Although the Apple AC adapter isn't cheap, getting an extra one enables you to keep two batteries charging in the charger and a third one charging in the PowerBook at the same time.

Don't expect batteries to last forever.

NiCad batteries are good for about 500 charges. Some last longer, and some die sooner. By now, some batteries purchased with the first crop of PowerBooks will have reached the end of their life span. If you're having trouble getting a full charge from a battery (and you've tried completely discharging and then recharging it), it's time to bite the bullet and buy a new one. Send the old one back to Apple for recycling.

Label your batteries.

You won't get any power out of a battery you've left behind in a hotel room. Just ask at the front desk of any large hotel whether its lost-and-found department has any notebook-computer batteries. They'll probably show you a box full of batteries, including some \$69 granite-colored ones. Taping your business card to your batteries boosts your chances of retrieving lost ones. While you're at it, add the purchase date and life expectancy to each battery's label. Tape business cards to your \$65 AC adapter and your \$89 recharger too. (That lost-and-found box is a good place to borrow batteries when you're desperate, by the way.)

Get and use cases for your batteries.

If you bought a PowerBook last year, you might not have protective cases for the batteries. There's a slight chance that an uncased battery can short and start a fire; get free cases from Apple by calling 800-377-4127.



MANAGING POWER

Given that PowerBook batteries don't last forever, learn to conserve power whenever possible. The following rules of thumb will make PowerBook power last longer. Many of these techniques are easier to follow if you get a PowerBook utility program. Otherwise, you'll be forced to get by with the more-limited options of Apple's control panels. Two third-party alternatives we've used and liked are CPU, from Connectix (415-571-5195), and GUM, from After Hours Software (818-780-2220). More utility collections were expected to be released shortly after this article went to press.

Watch out for major power drains.

Three things place the biggest power demands on your PowerBook: the backlighting, the hard drive, and the processor.

Exactly how you set the parameters for dimming the backlighting and resting the hard drive will depend on circumstance, experience, and personal preference. Although it's almost always more efficient to let your hard drive spin down during periods of inactivity, you'll find it irritating to constantly be forced to wait for it to spin back up again — especially if your applications frequently access the hard drive.

All PowerBooks rest the processor during periods of inactivity; you can disable this automatic napping with Apple's control panel, or you can control it with third-party utilities. Once again, the trade-off will be between a slight degradation of performance with some applications and the considerable power savings that resting your processor provides.

Finally, if you have a PowerBook (a 145, 160, 170, 180, or Duo) that gives you the option of choosing a slower processor speed, always choose the slower option when you're using battery power. This is the single biggest power-saving choice you have (see "Taking Charge: PowerBook-Battery Management" in this issue).

Use a RAM disk.

If you have sufficient memory (at least 6 megabytes), learn how to set up a RAM disk (instructions are in your PowerBook manual). Then copy your System file and some key applications to the RAM disk. This enables you to work for long stretches without using the hard drive at all.

Turn off AppleTalk.

If you aren't going to be using a network, turn off AppleTalk. When AppleTalk is active, it prevents the processor from resting, thereby causing a significant power drain.

Choose applications wisely.

Especially if you have only 4 megabytes of RAM, it's important to use applications that are "PowerBook friendly." That means they don't need a lot of RAM, don't take up a lot of disk space, and don't constantly wake up the hard drive. The first two criteria are easy enough to judge, but how can you test how often an application accesses the hard drive? Easy. Set your hard drive to spin down after the absolute minimum period of inactivity. Then find a quiet room, and start using the application, taking note of what kinds of actions cause the hard drive to wake up. Many popular applications (Microsoft Word, HyperCard, and FileMaker, for instance) place a lot of demands on the hard drive. If you must use such an application, seriously consider setting up a good-sized RAM disk. Three good applications for writing and note taking on a PowerBook are WordPerfect's LetterPerfect, Nisus' Nisus Compact, and TechWorks' Spiral.

Get a PowerSwap.

It's a simple idea, but kudos to Utilitron (214-727-2329) for being the first to implement it. The 140, 145, 160, 170, and 180 provide no backup battery power to keep the PowerBook safely sleeping while you remove one NiCad battery and insert another. If you aren't plugged in (which, face it, you probably aren't if you need to swap batteries), you'll have to shut down the PowerBook, change the battery, and restart. If you've got a lot of applications open, and especially if you're using a RAM disk, this means a lot of hard-drive wear and tear on your new battery. The PowerSwap is a simple \$39.95 device that, after you've attached an ordinary 9-volt transistor battery to it and put your PowerBook to sleep, plugs in to your PowerBook's AC-adaptor port and provides just enough current just long enough for you to swap batteries. Absolutely essential for long plane flights.

The PowerBook Survival Guide

ON THE ROAD

PowerBooks make fine computers for home or office use, but they really shine when you take them on the road. Here are some notes from the field, guaranteed to help you successfully navigate the airports and hotels of the world.

Take a sleeping PowerBook to the airport.

There's always a chance you'll be asked to turn on your PowerBook when you go through an airport's security checkpoint. If you decline to run your computer through the X-ray machine, if you're traveling internationally, or if you just plain look suspicious, that chance becomes a certainty. The easiest and fastest way to satisfy a security guard is to wake up a sleeping machine. After Hours' GUM program has a special feature that wakes up the PowerBook just long enough to satisfy the guard.

X-ray your PowerBook.

Most of the time, you can avoid having to start up the computer if you put it through the X-ray machine with the rest of your carry-on baggage. X-rays won't hurt your PowerBook or the data that's stored on it. There's a slight chance that the electric motors in the X-ray machine's conveyor belt will affect your data, though, so try to set the PowerBook down close to the machine's entrance for the shortest-possible ride.

If you get stuck in an airport, look for an electrical outlet.

Missed your connection? You can get some work done without wasting battery power if you can find an electrical outlet. Most airports have outlets in the floor or on walls for vacuum cleaners and floor waxers. This is the best argument for packing the AC adapter in your carry-on luggage.

Take a window seat.

Unless you're on a red-eye, a window seat gives you better light. That makes it easier to leave your backlighting turned down — a major power savings.

Plug the PowerBook's audio-out port.

Want to use your PowerBook to take notes at a conference? It's easy to turn the sound off with a control panel, but what if you have to restart the machine — after a

crash, for instance? Inserting a miniature phono plug into the audio-out port mutes the otherwise attention-getting startup chime. If you're traveling with a pair of Walkman-style headphones, they'll work in a pinch.



Don't get tied to the trackball.

Most people seem to like the PowerBook's trackball, but that doesn't mean it will always be comfortable in an airplane or at a hotel-room desk. Consider packing a mouse or another alternative input device such as a Thumbelina trackball, with its extra-long cord. Before you connect an Apple mouse to your PowerBook, make sure the mouse is a low-power model (Apple mice have been low-power since the days of the original Apple Portable). If your Apple mouse has a small circle on the bottom of the label, it's low-power.

Pack some emergency floppy disks.

At the very least, you should make a copy of the Apple Disk Tools disk to keep with



you. Really, though, you should bring along a complete set of System disks, at least in your checked luggage. A disk-recovery program wouldn't be a bad idea either. And you'll probably also want at least one floppy disk for backing up data.

Get a fax modem.

When you need to print something while you're on the road (and you aren't lugging a printer with you), the easiest way is to send a fax to yourself at your hotel. Many hotels don't charge for this service.

Learn and use AppleTalk Remote Access.

Did a copy of something called ARA (AppleTalk Remote Access) come with your PowerBook? If you can afford two 9,600-bps modems (one for your PowerBook and one for your base machine), ARA is definitely worth mastering. It connects you not only to your office machine but also to your office's entire AppleTalk network. With one phone call, you can print to an office printer, exchange files with your desktop Mac, and retrieve your electronic mail. ARA used to be included free with every PowerBook. Apple unbundled it with the latest round of PowerBooks, though, and it now retails for \$199.

Pack a couple of PhoneNET StarConnectors.

For less than \$75, you can make a simple connector that lets you easily share files with any other Mac (including your base machine). File sharing is explained in your Apple manual, and it's definitely one of System 7's most useful features for PowerBook owners. This is particularly important if you're using a PowerBook that doesn't have a floppy-disk drive. Stick one of Farallon Computing's \$29.95 StarConnectors onto each end of a regular phone cord (you'll probably be carrying the phone cord anyway if you have a modem). Plug the resulting "cable" in to the printer ports of your PowerBook and the other Mac to create an instant network.

Make a checklist.

If you don't want to leave town without the power adapter you plugged in to a socket behind your hotel-room bed, make yourself a checklist of all your PowerBook items. A carrying case with custom foam inserts for all your PowerBook accoutrements can also serve as a good reminder.

Check with your hotel switchboard.

If you're having trouble with telecommunications, it's possible that your hotel has a call-waiting service. Check with the switchboard to see whether call-waiting can be turned off.

Pack a long phone cord.

Hotel-room phones aren't always near a power outlet. Another possible solution for getting around awkward outlet configurations: Ask the hotel's housekeeping staff for an extension cord.

Pick your hotel wisely.

When making your hotel reservation, ask in advance what the phones are like. Some rooms may have better phone options than others. Best of all — and increasingly common — are hotel rooms with two separate lines: one for voice and one for data.

Pack a Swiss-army knife or a small screwdriver.

If the phone outlet in your hotel room isn't modular, don't give up right away. Removing the face plate often reveals a modular connector inside the wall. It can't hurt to look. To be prepared for any condition, also carry a cable with a standard modular phone jack on one end and alligator clips on the other. If there's no modular connection behind the face plate, you can clip directly onto the phone wires.



The PowerBook Survival Guide

POWERBOOKSHELF

If you're interested in buying a new PowerBook or just want to enhance the performance of your old one, check out the following articles. Since the PowerBook was introduced, *MacUser* has kept a close eye on new technology, new models, and new products from third-party vendors. The following articles have been selected from our recent PowerBook coverage and include lab reports, detailed product reviews, and helpful hints to boost your portable-computing power. They are listed in reverse chronological order.

"Presenters' Portables: The PowerBook 160 and 180," December '92, page 134

— This preview evaluates the newest additions to the PowerBook family and presents test results. A list of products available from third-party vendors is provided as well.

"The Convertible Mac: The Macintosh Duo System," December '92, page 144

— A first look at the new Duo System from Apple. Presents four configurations of the system and looks at the inner workings of the new technology.

"Breaking Out to the Big Screen: PowerBook and SCSI Display Adapters," December '92, page 172

— Testing and evaluation of three internal PowerBook Display adapters and three SCSI display adapters. Products soon to be released are discussed as well.

"Managing Power," November '92, page 255

— Three new utility packages for the PowerBooks are evaluated in the new Mobile Mac column. Also included is a discussion of the author's ideal PowerBook utility package.

"Fast Starter: The PowerBook 145," October '92, page 50

— The new PowerBook 145 is evaluated and compared with the other members of the PowerBook family.

"Synchronicity," October '92, page 261

— Describes how to keep your PowerBook's files reconciled with your desktop Mac's files. Included is a look at several

file-synchronization packages as well as a discussion of what to expect to see in future packages.

"The Ultimate PowerBook," October '92, page 268

— A variety of useful accessories such as modems, printers, and monitors for the PowerBooks is described.

"Hot PowerBook Files," September '92, page 287

— Lists shareware and freeware utilities designed for the PowerBooks and available from ZiffNet/Mac.

"The Well-Read Mac," July '92, page 205

— Offers hot battery-longevity tips.

"Swiss-Army Software," June '92, Buyer's Guide, page 44

— Integrated software packages are of particular interest to PowerBook users interested in conserving disk space and memory.

"More PowerBook Power," May '92, page 214

— Presents a list of tricks for making your battery last longer.

"More-Powerful PowerBooks," April '92, page 199

— Products from third-party vendors, from external-video adapters to fax modems, are discussed.

"The Personal PowerBook," January '92, page 193

— From cables to cases, here's a checklist of essential accessories for PowerBook owners.

"Introducing: The PowerBooks," December '91, page 104

— *MacUser's* first look at the Apple notebook computers, including a detailed explanation of the new technology that made portable computing from Apple truly portable.

MORE POWER TO YOU

These tips can make life on the road with a PowerBook more pleasant. And to find out just how far you can fly with your PowerBook before the lights go dim, check out this month's *MacUser* Labs report "Taking Charge: PowerBook-Battery Management," which proves that with proper care, your PowerBook batteries can far outlive the two- to three-hour life expectancy Apple gives them. In fact, we kept one humming for an entire transcontinental flight. If you can beat that, we'd love to know how. Send your power PowerBook tips to *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. ✉

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Expanding the PowerBook: 2.5-Inch Hard Drives

You never knew how small 20 or even 40 megabytes was until you bought your PowerBook. This month, MacUser looks at ten tiny drives that fit more chapters into that 'Book.

BY MARK FROST

Y

ou knew you'd soon outgrow your PowerBook's hard drive, but you didn't think it would happen so fast. Install your favorite word processor and spreadsheet program, and you've eaten up 5 megabytes or more. Add telecommunications software, your address book and calendar, and maybe a couple of good games, and you're seriously squeezed for room.



If more storage space is what you need and you want to maintain the portability and convenience that drew you to the PowerBook, you have three alternatives: adding a portable external drive, replacing the internal drive with a higher-capacity one, or using software compression trickery that crams more files onto your current disk than would normally fit.

For this month's report, we tested ten of today's 2.5-inch hard drives. We also previewed two new compression products that promise to double your current PowerBook drive's capacity (see the "Main Squeeze" sidebar) and took a close look at the next generation of high-capacity 2.5-inch hard drives (see the "On the Horizon" sidebar). We found the current crop erratic, compression seamless but slow, and the future promising.

Of the ten 2.5-inch drives we put through our full battery of hard-drive tests, five drives were *internal*, designed to replace your PowerBook's current internal hard drive, and five

were *external*, housed in pint-sized enclosures. Each drive is based on one of three varieties of the same mechanism. One — the external Mass Microsystems HitchHiker 40 — uses a 40-megabyte Quantum Go•Drive 40 mechanism. Three internal drives — the APS Go 80, the FWB hammerPB80i, and the PLI PL GO-80 — and three external drives — the La Cie PocketDrive 80, the Mass Microsystems HitchHiker 80, and the Tulin Technologies Little Neck 80 — use the 80-megabyte Quantum Go•Drive 80. Two internal drives — the FWB hammerPB120i and the Microtech Roadrunner 120i — and one external drive — the Mass Microsystems HitchHiker 120 — use the 120-megabyte Quantum Go•Drive 120.

In or Out?

Internal and external drives have their respective advantages and disadvantages. An external drive buys you all the added capacity of the new drive, but a higher-capacity internal drive adds only the difference between the

capacity of the old internal drive and that of the new one — although some vendors offer external cases for your old drive, so you get full use of both the old drive (now external) and the new one (internal). However, the current crop of external drives has some significant drawbacks.

Each of the external drives we evaluated for this report comes with a cable for getting power through the PowerBook's ADB (Apple Desktop Bus) port, into which you would otherwise plug an external keyboard or a mouse. Although this may seem like a convenient way to power a portable drive, we discovered that the power requirements of each drive exceed Apple's specifications for the total power that should be drawn from the PowerBook's ADB port. Apple specifies that no more than 50 milliamperes of power should be drawn from the ADB port on the PowerBook 145 and 170 and no more than 200 milliamperes from the PowerBook 160 and 180.

The Quantum Go•Drive mechanisms in the drives we tested require

The Main Squeeze

Increasing your PowerBook's storage capacity from 40 to 80 megabytes is going to cost you between \$350 and \$750 if you buy a new drive — and that's for a net gain of only 40 megabytes! But don't despair, you have an alternative: compression.

Simply put, compression software seeks out redundant information in your files and removes it to reduce your file size. Stand-alone compression applications such as AutoDoubler, Compact Pro, DiskDoubler, and Stuffit have been around for some time, but the new compression products from Stac Electronics and Golden Triangle offer something the others don't: invisibility.

Stac Electronics — a leader in the PC file-compression world — recently announced Stacker for Macintosh. Stacker installs an invisible software compression module between your drive's driver software and the Mac's file system. It also installs an invisible caching module designed to minimize the reduction in performance caused by the time it takes to compress or

decompress a file. The result is that for a minimal reduction in performance, your drive appears to have twice the capacity, depending on what kind of files you store — text files compress well, for example, whereas image files such as those used by Adobe Photoshop are far less compressible. Stacker notifies you of the space still available and updates the notification as the drive fills up. Stac Electronics, 5993 Avenida Encinas, Carlsbad, CA 92008; 619-431-7474.

Golden Triangle's TimesTwo replaces your driver altogether. Again, after you've installed TimesTwo, your drive appears to have twice its original capacity. Currently, TimesTwo doesn't update its indicator of the amount of space remaining as the drive fills; a dialog box warns you only when you're about to run out of space. Nor does TimesTwo offer any performance tweaks to minimize the performance hit caused by data compression/decompression. Golden Triangle, 4849 Ronson Court, San Diego, CA 92111; 619-279-2100.

To test the speed and efficiency of

these two invisible compression schemes, we ran our full suite of hard-drive performance tests on a Quantum Go•Drive 120. (Note that both compressors we tested were prerelease versions; the performance of the final versions may be slightly different.) When TimesTwo was installed, the 2,000-record 4th Dimension sort took more than twice as long as when it was performed on a mechanism with no compressor installed. With Stacker installed, the test took only 25 percent longer.

Our Finder copy test (the most grueling test for a compressor, because it requires the reading, decompressing, recompressing, and then writing of small chunks of data) with TimesTwo installed took more than three times as long as with no compressor, and with Stacker installed, it took about two and a third times as long.

Finally, we ran our DiskTop copy test, which performs the same grueling operations as our Finder copy but moves data in much larger chunks. With TimesTwo installed, the copy took almost six

Figure 1: Price Versus Speed

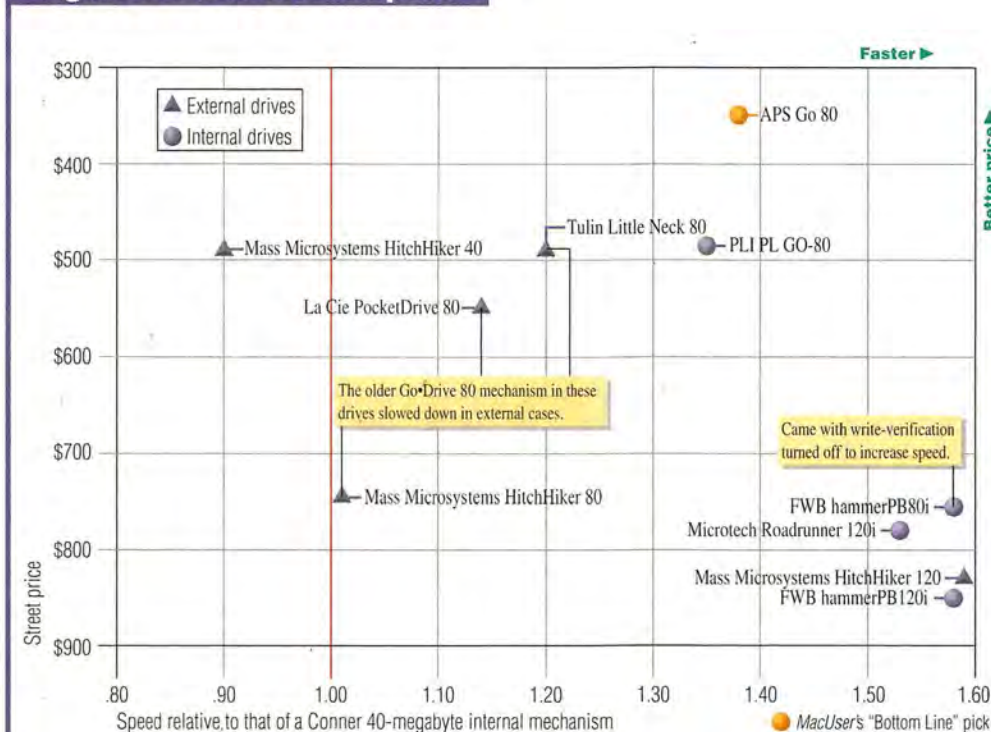


Figure 1: If you want a fast drive for your PowerBook, choose a high-capacity internal drive. That's the conclusion we came to after subjecting the drives to our suite of three application-based speed tests. We calculated each drive's speed relative to that of the internal Conner 40-megabyte hard-drive mechanism that comes standard in the PowerBook and plotted the results against the street price of each drive.

times as long, and with Stacker installed, it took only two and two-thirds as long to complete the test.

Although in these tests of prerelease versions, Stacker seemed the faster product, it's important to remember that the amount of time you spend accessing your drive is probably a minute fraction of the total time you sit at your computer. This is especially true if you're using a PowerBook — these computers are rarely used with complex databases or for professional image processing.

And although performance is important to us all, data security is even more important. The publisher of each product claims that the software is compatible with the major data-recovery utilities, but we were unable to test these claims by press time. If you decide to try one of these products, we suggest that you back up your drive before installing it and continue to back up regularly. Also, it wouldn't hurt to keep an emergency boot floppy disk handy, along with floppies containing your most important applications and files.

40 milliamperes while sleeping and as much as 450 milliamperes while operating. Devices that require more juice than is specified for the ADB port can be hazardous to your PowerBook, and using the ADB port as a power source for your external drive definitely degrades the performance of the drive.

Because of the danger of powering a drive from the ADB port — which includes the possibility of expensive damage to your PowerBook's motherboard — we believe that external drives should draw their power from elsewhere. Because the external drives from Mass Microsystems offer no other means of getting power, we think they are poor solutions for PowerBook users who have a storage shortage.

The other external drives come with AC adapters. Although they aren't ideal portable storage devices, AC-powered external drives remove the risk of damage to your PowerBook. As testing ended, some other vendors

came up with their own ways of untethering external drives while eliminating danger to your PowerBook's motherboard (see the "On the Horizon" sidebar).

Insert Tab A into Slot B

When you're dealing with an internal drive, there are different hurdles to overcome. First, installation can be tricky. Second, if you do install an internal drive yourself to save a few bucks, you'll sacrifice your PowerBook's warranty. For the brave, the APS Go 80 and the PLI PL GO-80 include detailed installation instructions — but neither includes the necessary tools.

The FFW hammerPB80i and hammerPB120i come with only minimal instructions and a strong recommendation that your dealer install the drive for you. The Microtech Roadrunner 120i's instructions are thorough, but the illustrations are difficult to follow. We found dealers willing to

install an internal drive in a PowerBook for \$30 to \$90. If you need the name of your nearest Apple authorized dealer, call 800-538-9696; you can reach Apple technical support at 800-767-2775.

If you buy an external drive, chances are good you'll want to connect it to both your PowerBook and your desktop Mac if you have one, so you'll need a variety of cables. Unfortunately, no manual for the drives we received for testing addressed the PowerBook specifically. During our testing, however, La Cie sent copies of an updated manual that included information specific to the installation and use of its PocketDrive with a PowerBook.

Only the La Cie PocketDrive 80 includes the HDI-30 SCSI cable necessary for connecting an external SCSI device to a PowerBook. However, the PocketDrive 80 had problems connecting to the LC, LC II, and IIsi when these computers had a 12-inch monitor on top — when connected directly to the Mac, the drive hit the 12-inch monitor's cables, forcing the

monitor to one side. A 13-inch monitor caused no problem, though. The Tulin Little Neck 80 couldn't fit over the IIsi's curved fan grille. Furthermore, it blocked the fan grille on the IIsi and had the same problems as the PocketDrive 80 with the LC, LC II, and IIsi. The Mass Microsystems HitchHiker 40, 80, and 120 had no problems fitting the IIsi but had the same problems as the other drives with the LC and LC II.

More disturbing, however, was the consistently incorrect information regarding the SCSI-cabling requirements of each external drive. All the manuals repeated the standard termination and cabling cautions that come with any 3.5-inch or 5.25-inch external drive — you should daisy-chain no more than seven devices and have a maximum total cable length of 6 meters — but the cabling requirements for Quantum 2.5-inch drives are very different.

Typically, each terminated signal line draws about 9 milliamperes, which adds up to a substantial amount

of power for all of a SCSI cable's 19 signal lines. If your PowerBook drive were fully terminated, battery life would suffer.

The drives we tested use a partial-termination scheme to conserve power: They provide only enough termination to allow you to mount your internal drive and perhaps one or two external SCSI devices (see the "Terminator" sidebar). That is, a chain that uses one of these mechanisms as the first device — either internal or external — can reliably be no longer than about 1.5 feet and can contain only one or two other devices. So if you've had problems mounting multiple SCSI devices on your PowerBook, it's probably due to the partial termination of your PowerBook's internal drive.

If you plan to use your PowerBook as a replacement for a desktop machine and to add external drives, a scanner, or other SCSI devices, you really should change your termination strategy. Because your PowerBook's internal 2.5-inch drive is not fully terminated, the installation of a

On the Horizon

The PowerBooks have enjoyed unprecedented success, and increasing numbers of manufacturers are interested in making compatible drive mechanisms. IBM is producing 80- and 120-megabyte mechanisms that Apple now uses in its standard-issue 80- and 120-megabyte internal PowerBook drives. Maxtor, which announced — but never released — a 120-megabyte SCSI mechanism about a year ago, has recently announced a 250-megabyte, 2.5-inch SCSI mechanism. And Digital Equipment is looking to get a foot in the door with its high-performance, power-hungry 220-megabyte DSP2022S mechanism.

Fujitsu and Seagate are also planning to release high-capacity mechanisms for the PowerBooks — a 235-megabyte mechanism from Fujitsu and 200- and 250-megabyte mechanisms from Seagate. Some of the Seagate mechanisms contain shock sensors that automatically park the heads whenever the mechanism is jarred, protecting against head crashes that may well cripple your drive and destroy your data.

Unfortunately, the only Seagate mechanisms that now include this feature are those that are designed for laptops other than PowerBooks.

A Seagate spokesperson noted that it would be simple and inexpensive to add the same shock sensors to the SCSI version of these mechanisms —



Clockwise from top: The 200-megabyte Seagate ST9235, APS' external battery-powered case, Quantum's 80-megabyte GoDrive GRS 80, and the 160-megabyte GoDrive GRS 160.

Figure 2: Price Versus Service and Packaging

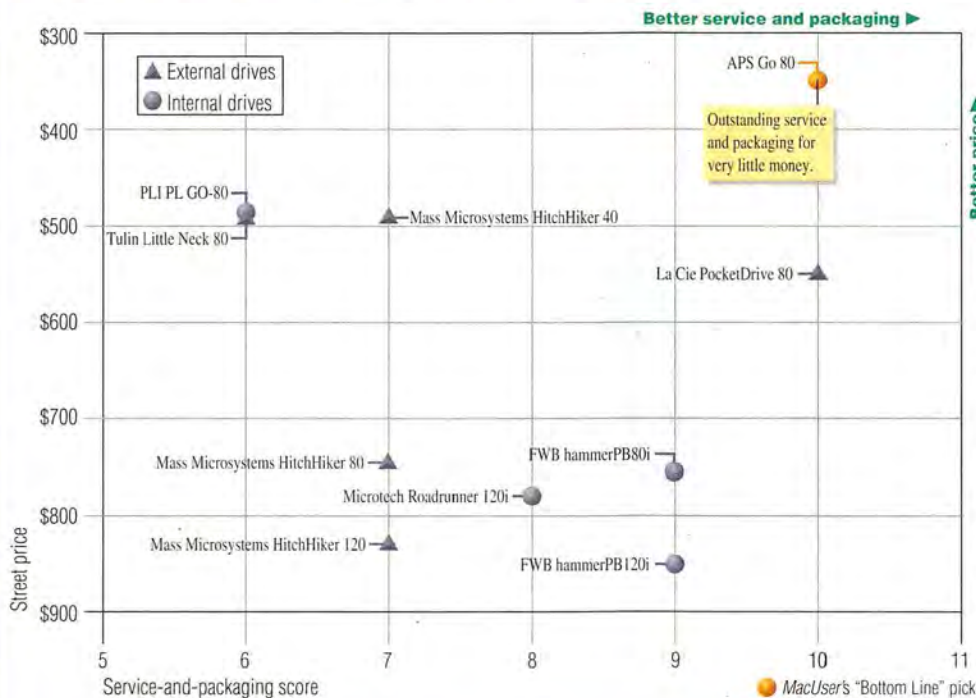


Figure 2: When you buy a drive — especially from a mail-order house such as APS or La Cie — it's important that it reaches you safely and, once it's there, that you have access to high-quality after-sale service. We gave each drive a score for the quality of its packaging and the level of the vendor's after-sale service and then plotted that result against the street price of each drive.

the version required for the PowerBooks. At press time, however, no one — neither Apple nor third-party drive vendors — had requested this important safety feature.

Quantum continues to upgrade its 2.5-inch-mechanism line by dropping the old Go•Drive 80 mechanism used in many of the drives we looked at for this report and replacing it with the Go•Drive GRS 80. It will also add the 160-megabyte Go•Drive GRS 160 to the line. Quantum will continue to produce both the Go•Drive 40 and the Go•Drive 120 mechanisms.

We had a chance to test the new Go•Drive GRS 80 and 160 mechanisms from Quantum as well as the 80-megabyte IBM, 220-megabyte Digital Equipment, and 200-megabyte Seagate mechanisms. We used the same speed tests as we used for the drives in this report, formatting each mechanism with FWB's Hard Disk ToolKit.

The Quantum Go•Drive GRS 80 performed almost identically to the Go•Drive 80, and the IBM WDS-280 80-megabyte mechanism was slightly slower.

The 200-megabyte Seagate ST9235 mechanism was slightly slower than the Quantum Go•Drive 120, and the Quantum Go•Drive GRS 160 and the 220-megabyte Digital Equipment DSP2022S were both slightly faster. At press time, Digital Equipment's engineers were still modifying the DSP2022S' cache to further increase speed.

Because of the danger and inconvenience of getting power for an external drive from the PowerBook's ADB port, perhaps the most important PowerBook storage advance is the battery-powered external drive.

APS, for example, now offers a battery-powered external case (without a drive) for \$120 that can keep a Quantum Go•Drive 120 running for approximately two hours. One handy trick to this external case is that a battery charger designed to charge remote-controlled model-car batteries can, with a slight modification, recharge the APS case's battery in only 15 minutes. This fast-charge technique reduces the overall life of the battery, but a replacement battery costs only \$17.

pass-through terminator block between your PowerBook and your first storage device should reduce reflections from your internal drive and the external devices in your chain (you'll need to terminate the last device in the chain as well). It's also important that the cable between your PowerBook and your first external device be as short as possible — and it helps if all your cables contain high-quality insulation and wire with the same gauge. If you don't have a pass-through terminator and have an external device that can be internally terminated, place that device closest to your PowerBook and put your terminating block on the last device.

Get with the Format

Each of these tiny drives comes preformatted, but it's good to know that if you ever need to reformat your drive, you'll have software that is easy to use and does the job. Superior formatting software normally includes a

The Terminator

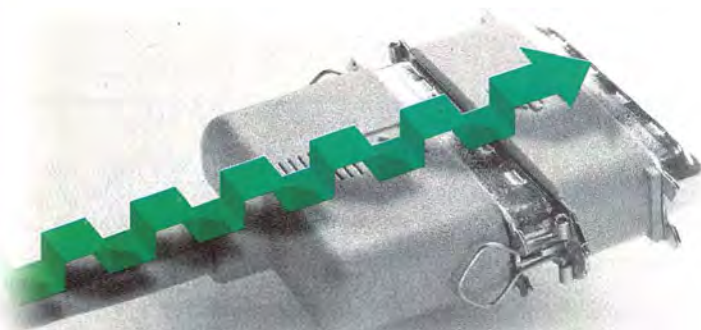
Like those who sent Arnie to eliminate rebel entities, SCSI chains use terminators of their own. SCSI terminators are designed to absorb signal reflections that might otherwise be read as separate signals. They do this by soaking up the

signal's energy and preventing a reflection at each end of the wire. Keeping the wire very short can eliminate the need for a terminator, because the reflections occur so soon after the original signals that false data readings do not occur.



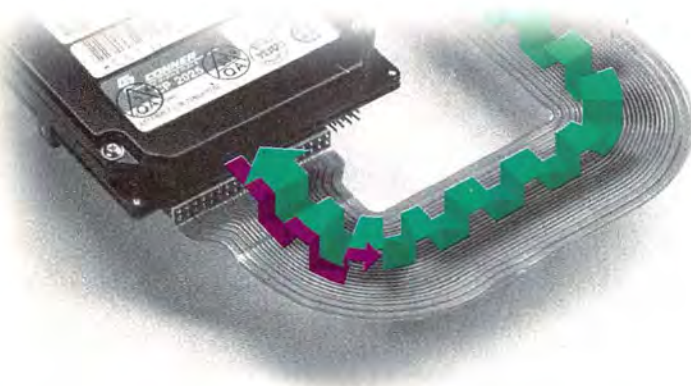
No Termination

Without termination, a *wave* (a signal down a wire) reflects when it hits the end of the wire, much as when a wave of water hits the side of a pool. The reflected wave then travels back down the wire and can potentially trigger false data readings, because it appears as a time-delayed version of the original signal.



Full Termination

Full termination draws power — typically 9 milliamperes per signal line (a SCSI cable has 19 signal lines) — to operate the terminating resistors that absorb the waves. Absorbing the waves eliminates signal reflection.



1K Pull-ups

To get around the power requirements of termination, manufacturers of 2.5-inch mechanisms are installing partial termination, using *1K pull-ups* — 1-kilohm resistors (an ohm is a measure of resistance; the higher the resistance, the fewer the signals that get through). A 1K pull-up can absorb only the peaks of the waves (which equate to 1s in the Mac's binary language). The result is that 1K pull-ups draw less power, but their limited termination allows you to mount only one or two devices on a shortened SCSI chain.

— Peter Baum

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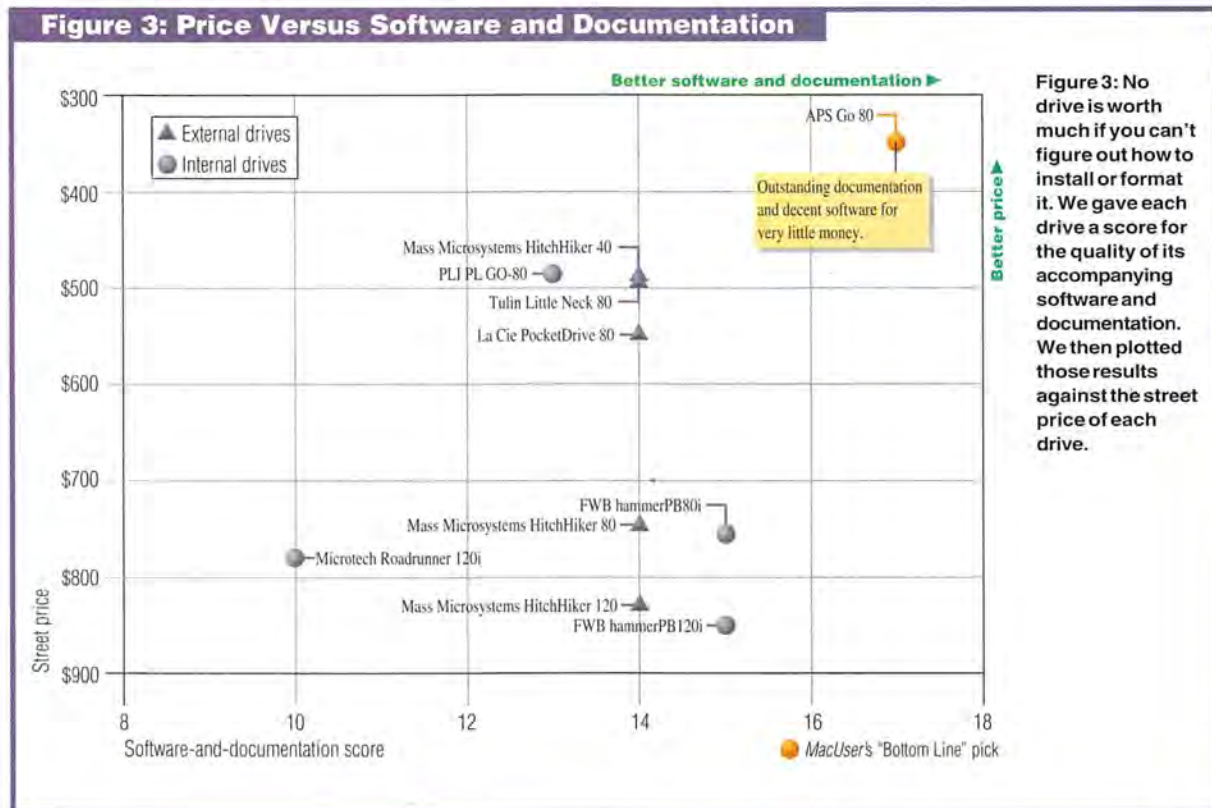
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* Introductory offer on Ultima Home Office for PowerBook ends March 31, 1993.

CIRCLE 58 ON READER SERVICE CARD.

Figure 3: Price Versus Software and Documentation



variety of features such as basic file-recovery and disk-optimization features and the ability to partition the drive and install password protection and encryption security to those partitions. But on minidrives designed for notebook computers, basic formatting software that's easy to use and that takes advantage of the drive's performance features is good enough.

The FWB hammerPB80i and hammerPB120i come with Hard Disk ToolKit. Along with a formatting module, Hard Disk ToolKit includes the powerful World Control module, which allows you to tweak your drive for optimum performance, provided you know what you're doing. As much as we like the power of World Control, it's of little benefit in this case, because there are few things you can do to speed up these drives. As long as the formatting software recognizes that the drive has a write cache (special memory that speeds the writing of data to the disk), turns it on, and lets

you choose whether you want the extra security of write verification (an extra read cycle that checks the data just written) or a 30-percent speed improvement with write verification off, your minidrive will be operating about as quickly as it can.

The formatters that come with the Microtech Roadrunner 120i and the PLI PL GO-80 offer only partitioning but are extremely easy to use. However, the formatting software included with the PLI PL GO-80 and the APS Go 80 we tested failed to turn on the drives' write cache, slowing the drives noticeably. APS is aware of the problem and claims to have corrected it in the formatting software it now ships with the APS Go 80; PLI was unaware of the problem at test time but has since promised to fix it.

One surprising — and annoying — discovery we made was that the Tulin Little Neck 80 ships with System 6.0.7 installed and that the FWB hammerPB80i and hammerPB120i come with

System 7.0 installed. The PowerBook 100 can run System 6.0.8, but all the other PowerBooks require System 7.0.1 or later. The drives from Mass Microsystems, PLI, and Microtech come with System 7.0.1 installed, but only the APS drive has System 7.0.1 with Apple's latest Tune-Up version, 1.1.1. For vendors selling drives to PowerBook users, it doesn't make much sense to have incompatible system software installed.

Good Drive Year?

It's easy to accept that some wine vintages are better than others. The weather varies, and sometimes you get a good year and sometimes a not-so-good one. But with hard drives, we expect consistency: One hard drive's quality should not be drastically different from that of an identical drive manufactured last year — or last month. Unfortunately, it may be.

When testing the speed of these drives, all of which use Quantum

WARNING Very Fast

Don't say
we didn't warn
you. Because the PLI
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*external drives

CIRCLE 66 ON READER SERVICE CARD.

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mechanisms, we expected to find almost identical performance for drives of the same capacity. It's possible that a drive might have a few bad spots that can't accept data, which might cause it to perform poorly but not radically so. Our tests, however, told a different story — a disturbing one.

We ran our suite of application-based speed tests — a 2,000-record 4th Dimension-database sort to examine access speed, a 13-megabyte DiskTop copy to check sustained throughput, and a 13-megabyte Finder copy to test cache efficiency.

The one 40-megabyte drive we tested, the Mass Microsystems Hitch-Hiker 40, performed as we expected it to relative to the Mass Microsystems

80- and 120-megabyte drives. Among the 80-megabyte drives, however, overall performance varied by as much as 58 percent, and for the 120-megabyte drives, performance varied by as much as 20 percent in some of our tests.

With two of the internal drives — the APS Go 80 and the PLI PL GO-80 — we discovered that the write cache had not been turned on by the formatting software supplied with them. The software has since been revised to turn the write cache on by default. Not only was there variation among all the internal drives but also the external 80-megabyte drives were much slower than the internal ones.

A few calls to Quantum uncovered

part of the reason: The company's spokesperson acknowledged that a production problem with some early mechanisms could have caused a slight throughput-rate decrease. According to Quantum, there is unfortunately no way for users to identify the earlier Go•Drive mechanisms to tell if they were manufactured before or after the production problem was fixed. This explained the differences within each group of 80- and 120-megabyte drives but didn't explain the differences between the internal and the external 80-megabyte drives.

After more sleuthing (see the "How We Tested" sidebar), we discovered a flaw in the Quantum Go•Drive 80 mechanism itself — it lacks a voltage regulator, which the 120-megabyte mechanism has. The result is that if the power going to the mechanism fluctuates in any way or if there is extra resistance on the lines supplying power to the mechanism, the mechanism will slow down. Because the wiring within the external cases and the AC adapters add resistance to the lines carrying power to the mechanism, the mechanism slows down. As any mechanism heats up, its platters expand and the tracks on them get farther apart. So as a mechanism operates, it periodically takes its own temperature. When it recognizes a change in internal temperature, it examines the new location of each track and repositions its read/write heads accordingly — a process called *thermal recalibration*. Unfortunately, the Go•Drive 80 interprets minor fluctuations in power as temperature fluctuations, which forces the mechanism to recalibrate far too frequently when it's installed in an external case. More time is spent recalibrating and less on the mechanism's main duty — reading and writing your data.

When we brought our findings to Quantum, it explained that it had stopped manufacturing the Go•Drive 80 mechanism and was now producing a replacement, the Go•Drive GRS 80, which has a voltage regulator. We suggest that you ask your dealer which

How We Tested

Testing hard-drive performance isn't usually that difficult — time-consuming, yes; exacting, yes; but not rocket science. For this report, we tested drives that use three different mechanisms, all from the same manufacturer and all strikingly similar, so we assumed that testing would be a breeze — all the 80-megabyte drives should perform about the same, and all the 120-megabyte drives should perform about the same, with only minor variations.

Our test platform was a PowerBook 170 with 4 megabytes of RAM, running System 7.0.1 with Apple's Tune-Up 1.1.1. We used a Conner 40 mechanism as our control, and a Conner 40 mechanism was installed internally when we tested the external drives.

Our first hint that testing was not going smoothly came when we noticed that within the group of 80-megabyte drives, there was a 20- to 58-percent variation in overall speed and a variation of 20 percent within the group of 120-megabyte drives for some tests. We subsequently discovered that the external Go•Drive 80-based drives were consistently slower than the internal Go•Drive 80-based ones. We also found that the APS Go 80 and the PLI PL GO-80 internal drives were significantly slower than the FWB hammerPB80i.

Using the World Control module in FWB's Hard Disk ToolKit, we discovered that the APS and PLI formatters failed to turn on the respective drives' write caches. We also found that the original Quantum Go•Drive mechanisms

had a production problem that manifested itself in a throughput-rate decrease. And, unfortunately, there is no way to tell by looking at the drive mechanism whether it was made before or after this problem was fixed. This discovery explained the 20-percent variation in results that we found within both the 80- and the 120-megabyte-drive groups but not the consistently greater speed of the internal 80-megabyte drives over the external ones.

Believing that the power source had something to do with the speed variations, we hooked up a voltage meter to investigate how each drive reacted to power. The drives were clearly getting enough power, both from the AC adapter and from the ADB port. However, any resistance added to the power line resulted in a drop in speed.

After we'd reported our findings to Quantum once again, the company admitted that the Go•Drive 80 mechanisms, unlike the Go•Drive 120 and all subsequent mechanisms, do not have a voltage regulator. Without a voltage regulator, the mechanism interprets any fluctuations in voltage as changes in temperature. It responds by nearly constantly performing a *thermal recalibration* — repositioning its read/write heads, because it expects the platters to expand or shrink with the perceived temperature change. Because the mechanism spends so much time trying to recalibrate itself, its performance degrades markedly.

— Kristina De Nike

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The Bottom Line

If you need more storage capacity for your PowerBook and don't want to pay the performance penalty exacted by compression software, you have two options: Buy a portable external drive or buy a higher-capacity internal drive to replace the one you have.

The **APS Go 80** (\$349 direct) is the easy pick among the 80-megabyte internal drives. At this price, you can buy the drive, a copy of FWB's Hard Disk ToolKit (an exceptionally powerful hard-disk utility), and an external battery-powered case and have the new drive installed in your PowerBook and the old drive installed in the external case for less than the average street price of the FWB 80-megabyte internal drive without installation.

With the 120-megabyte internal drives, it's a toss-up between the **FWB hammerPB120i** (\$999 list, \$850 street) and the **Microtech Roadrunner 120i** (\$899 list, \$780 street). The FWB hammerPB120i comes with Hard Disk ToolKit; the Microtech Roadrunner 120i has toll-free technical support and a two-year warranty.

If you're looking for a word that best describes how we feel about the external drives we examined for this report, *disappointed* would probably be it. Our tests — and data from Apple — revealed that getting power for an external drive from the PowerBook's ADB port is not recommended.

Both the La Cie and the Tulin external drives had problems when connecting to an LC, LC II, or IIsi when these machines had a 12-inch monitor on top, because they ran up against the monitor's cabling. Also, the Tulin drive couldn't fit over the IIsi's curved fan grille and completely covered the fan grille on the IIsi. The La Cie PocketDrive 80 was the best-built of the bunch and it offered the

best documentation and warranty of the external drives, but until the external drives can run under their own power, we can't recommend them as conveniently portable storage devices for the PowerBooks.

If the three-digit prices put a new PowerBook drive beyond your means, we suggest that you check out Stac Electronics' Stacker for Macintosh or Golden Triangle's TimesTwo — inexpensive driver-level compression software.



The APS Go 80 offers excellent documentation and support — and has the lowest price of the bunch.

Go•Drive 80 mechanism it's selling — the Go•Drive 80 or the Go•Drive GRS 80. The easiest way of telling the old one from the new one is by the part number printed on the top: Go•Drive 80 part numbers begin with GO80, and Go•Drive GRS 80 part numbers start with GL80.

What's It Worth?

When we began testing, 120-megabyte Quantum Go•Drive mechanisms were in short supply, but you can expect most of the vendors mentioned in this report to have Go•Drive 120-based drives by now. If you opt for an external drive, no matter what its capacity, make sure it comes with an AC adapter. But if portability is important, we recommend checking out some of the battery-powered external cases now available — APS sells one for \$120.

If you decide to purchase a higher-capacity internal drive, price — along with the vendor's reputation, service, and support — is key. What you're

paying for is a bare mechanism, some screws, and formatting software. Find the best price for the mechanism of your choice, buy it, and have your nearest Apple authorized dealer install it for you. For our picks, see the "Bottom Line" sidebar.

Remember, chances are good that if you use your PowerBook mainly for word processing, a little spreadsheet work, and accessing your E-mail, you won't really exercise your hard-disk drive that much. The greatest advantage of a new drive is increased capacity — and believe it or not, a new drive might not prove to be the best choice for you. Driver-level compressors (see the "Main Squeeze" sidebar) such as TimesTwo, from Golden Triangle, or Stacker for Macintosh, from Stac Electronics, can help you postpone buying that higher-capacity drive for some time to come.

Mark Frost is a MacUser associate editor. Kristina De Nike, a project leader at ZD Labs, managed the testing for this report.

Table 1 Criteria

List price — The vendor's retail price for the drive.

Street price — The average price of the drives we tested at dealers surveyed across the U.S. or through mail order in October 1992.

SCSI termination — For the external drives, whether the drive is terminated internally, through an external terminating block, or with a switch.

Software — The name of the formatting software and whether or not it provides partitioning, backup, password-protection, data-encryption, file-recovery, and disk-optimization features.

AC adapter — For the external drives, is an AC power adapter included so that the drive can be plugged in to a wall outlet?

Turnaround time — The guaranteed maximum time taken to return a corrected product.

FCC certification — For the external drives, the type of FCC certification (Class A or Class B). According to the FCC, Class A products should not be sold in the consumer market.

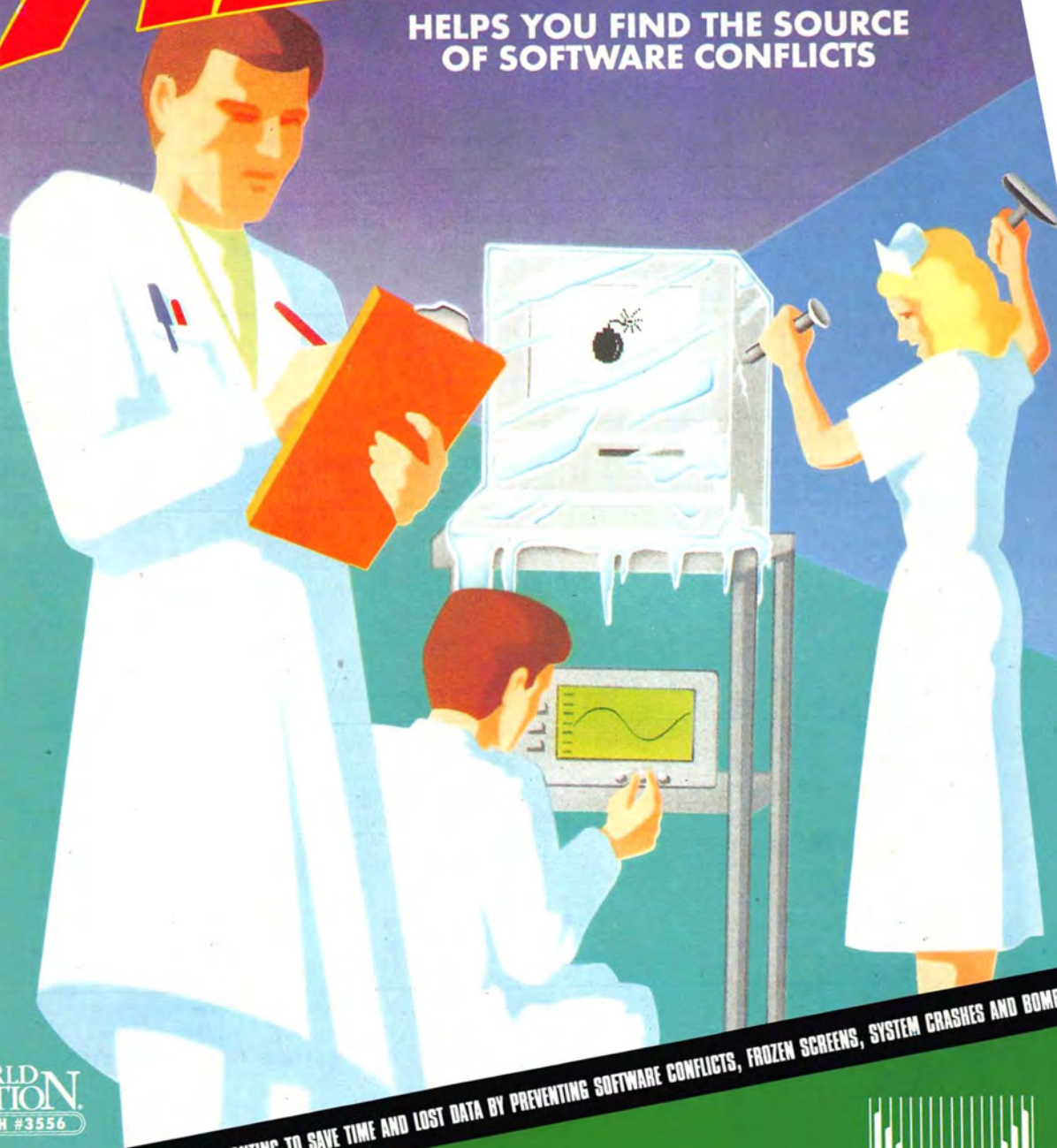
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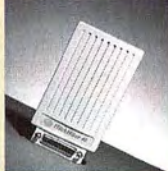

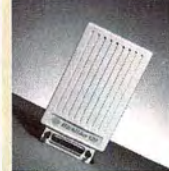
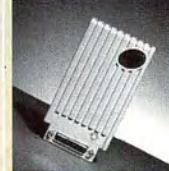
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Table 1: Features of 2.5-Inch Hard Drives

	External				
					
● = yes ○ = no	La Cie PocketDrive 80 \$\$\$	Mass Microsystems HitchHiker 40 \$\$	Mass Microsystems HitchHiker 80 \$\$	Mass Microsystems HitchHiker 120 \$\$	Tulin Little Neck 80 \$\$\$½
List price	\$549	\$599	\$899	\$999	\$489
Street price	\$549 (direct)	\$490	\$745	\$830	\$489 (direct)
Pros	Two-year warranty. 30-day money-back guarantee. 48-hour repair turnaround.	Toll-free tech support.	Toll-free tech support.	Toll-free tech support.	
Cons	No battery power.	No AC adapter. Polarity of power connector reversed. No battery power.	No AC adapter. Polarity of power connector reversed. No battery power.	No AC adapter. Polarity of power connector reversed. No battery power.	Awkward cabling. No battery power.
Hardware					
Capacity (advert./actual)	80 MB/80.7 MB	40 MB/40.1 MB	80 MB/80.8 MB	120 MB/118.7 MB	80 MB/80.5 MB
SCSI termination	externally switchable	internal	internal	internal	internal
Software					
Formatter	Silverlining	PadLok	PadLok	PadLok	SpotOn
Partitioning	●	●	●	●	●
Backup	○	○	○	○	○
Password protection	●	●	●	●	●
Data encryption	○	○	○	○	○
File recovery	○	○	○	○	○
Disk optimization	●	○	○	○	○
Other					
AC adapter	●	○	○	○	○
Standard warranty	2 years	1 year	1 year	1 year	1 year
Service	direct	dealer	dealer	dealer	direct
Money-back guarantee	30 days	○	○	○	○
Turnaround time	48 hours	○	○	○	○
Extended warranty	○	○	○	○	\$50/year
Toll-free tech support	○	●	●	●	○
Data-recovery service	●	●	●	●	●
FCC certification	Class B	Class A	Class A	Class A	Class B
Company	La Cie Ltd. 8700 S.W. Creekside Pl. Beaverton, OR 97062 800-999-0143 503-520-9000 503-520-9100 (fax)	Mass Microsystems 810 W. Maude Ave. Sunnyvale, CA 94086 800-522-7979 408-522-1200 408-733-5499 (fax)	Mass Microsystems 810 W. Maude Ave. Sunnyvale, CA 94086 800-522-7979 408-522-1200 408-733-5499 (fax)	Mass Microsystems 810 W. Maude Ave. Sunnyvale, CA 94086 800-522-7979 408-522-1200 408-733-5499 (fax)	Tulin Technologies 2156H O'Toole Ave. San Jose, CA 95131 408-432-9057 408-943-0782 (fax)

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DEALERS CIRCLE 32 ON READER SERVICE CARD.

Table 1: Features of 2.5-Inch Hard Drives, continued

	Internal				
					
● = yes ○ = no	APS Go 80 tttt	FWB hammerPB80i ttt	FWB hammerPB120i ttt	Microtech Roadrunner 120i ttt½	PLI PL GO-80 ttt
List price	\$349	\$889	\$999	\$899	\$799
Street price	\$349 (direct)	\$755	\$850	\$780	\$485
Pros	Inexpensive. Toll-free tech support. Detailed installation instructions.	48-hour repair turnaround. Detailed software instructions.	48-hour repair turnaround. Detailed software instructions.	Inexpensive. Two-year warranty. Toll-free tech support.	Toll-free tech support. Detailed installation instructions.
Cons	Original formatter failed to turn on write cache.	Expensive. Minimal installation instructions.	Minimal installation instructions.		Original formatter failed to turn on write cache.
Hardware					
Capacity (advert./actual)	80 MB/80.8 MB	80 MB/80.8 MB	120 MB/118.7 MB	120 MB/118.7 MB	80 MB/80.8 MB
SCSI termination	NA	NA	NA	NA	NA
Software					
Formatter	Alliance Power Tools	Hard Disk ToolKit	Hard Disk ToolKit	Roadrunner Formatter	PLI Formatter
Partitioning	●	●	●	●	●
Backup	●	○	○	○	○
Password protection	●	●	●	○	○
Data encryption	○	●	●	○	○
File recovery	○	○	○	○	○
Disk optimization	○	○	○	○	○
Other					
AC adapter	NA	NA	NA	NA	NA
Standard warranty	1 year	1 year	1 year	2 years	1 year
Service	direct	dealer	dealer	direct	dealer
Money-back guarantee	30 days	○	○	○	15 days
Turnaround time	○	48 hours	48 hours	48 hours	○
Extended warranty	○	10% of retail	10% of retail	\$89/year	\$80/year
Toll-free tech support	●	○	○	●	●
Data-recovery service	●	●	●	●	●
FCC certification	NA	NA	NA	NA	NA
Company	Alliance Peripheral Systems 2900 S. State Rte. 291 Independence, MO 64057 800-235-2750 816-478-8300 816-478-4596 (fax)	FWB 2040 Polk St., Ste. 215 San Francisco, CA 94109 415-474-8055 415-775-2125 (fax)	FWB 2040 Polk St., Ste. 215 San Francisco, CA 94109 415-474-8055 415-775-2125 (fax)	Microtech International 158 Commerce St. East Haven, CT 06512 800-626-4276 203-468-6223 203-468-6466 (fax)	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 800-288-8754 510-657-2211 510-683-9713 (fax)

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BY BRUCE I. BERKOFF

H

alf a million PowerBook users ask the same question: How can I get more life out of my PowerBook battery? An entire industry is evolving to answer it, hoping for a share of the \$1 billion spent on PowerBooks last year. Competitors to Apple's batteries have appeared, new recharging techniques and technologies are available, and battery-longevity secrets are hotly debated.

This month, we turn our analytical eye toward three keys to squeezing the last minute of power from your PowerBook: the best battery to buy, how to recharge it, and how to budget its precious current. Follow our advice, and you can work all the way from San Francisco to New York without having to rummage through your carry-on luggage for a fresh battery.

Figure 1: Manifest Density

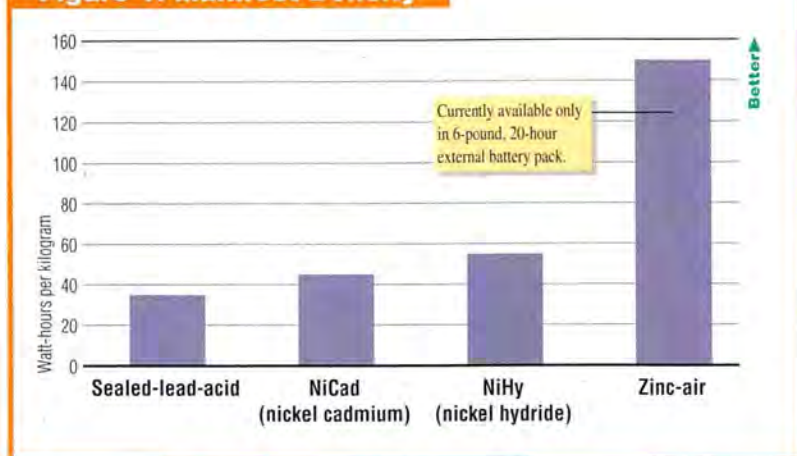


Figure 1: New battery technologies are emerging that provide even greater energy (measured in watt-hours) per kilogram — or *energy density* — than NiCad batteries do, resulting in longer battery life per charge or lighter batteries. The new PowerBook Duo 210 and 230 use NiHy batteries, which have a 20 percent greater energy density than NiCad batteries do. Manufacturers of the new zinc-air batteries claim that they have more than three times the energy density of NiCad batteries.

Buy a Better Battery

When you're looking at ways to get more out of your PowerBook, the battery is the most obvious place to begin. Apple seems to agree and has significantly upgraded the batteries it now supplies with its PowerBook 145, 160, and 180 from those it first offered with the PowerBook 140 and 170.

To find out just how much more power these new batteries pack, we tested the battery that came with the PowerBook 140 and 170 and compared it with an MC-170 battery, from BTI (Battery Technology, Inc.). The MC-170 uses a technology similar to that of the new Apple batteries, which were not available at the time of our testing. In individual tests, this improved *NiCad* (nickel cadmium) technology increased storage capacity by 10 to 25 percent compared with the older Apple PowerBook 140/170 batteries — the average overall increase hovered around 17 percent. Some third-party vendors claim that this technology produces increases of as much as 66 percent, but our tests show that any claim of more than 20 percent is like Mark Twain's early

obituary — greatly exaggerated.

Although Apple simply improved the battery it offers with its new full-sized PowerBooks, it introduced an entirely new type of battery with the PowerBook Duo 210 and 230. The Duo's batteries use *NiHy* (nickel hydride) technology, which offers about 20 percent more energy density than NiCad batteries do (see Figure 1). NiHy batteries are also better for the environment, because they don't contain cadmium, which is toxic.

Battery improvements don't stop at NiHy technology: A new technology, *zinc-air*, offers more than three times the energy density of NiCad batteries (see the "On the Horizon" sidebar) and nearly five times that of the *sealed-lead-acid* technology used in the original Mac Portable and PowerBook 100 batteries. As this report went to press, however, zinc-air batteries were available from only one company, AER Energy Resources, and in only one form, as an external battery pack.

NiCad batteries have a total reusable life of 500 to 700 full charges, although your method of recharging a battery has a significant impact on its total life. If you've been using your

PowerBook for quite some time, your batteries may be near the end of their useful life — and you may have shortened their life if you recharged them with Apple's PowerBook Battery Recharger.

Trickle-Downer

You can recharge your PowerBook battery in two ways: using a fast charge or using a trickle charge. The battery charger you use dictates the speed of the charge. Fast-charge mode is just that — fast — whereas trickle-charging takes significantly longer. When your PowerBook is plugged in to AC power, it's in trickle-charge mode. The PowerBook AC adapter slowly recharges your battery while simultaneously powering your PowerBook — taking eight to ten hours to fully charge the battery. If you want to charge your battery faster, you'll need an external charger.

We tested three external chargers — the Apple PowerBook 140/170 Battery Recharger, the Lind Electronic Design Full-Cycle Charger/Conditioner, and the Madson Line System 90 Charger — each with a different

On the Horizon

The latest news in PowerBook power includes two new battery technologies — one of which takes its power out of thin air.

The new PowerBook Duo 210 and 230 have light *NiHy* (nickel hydride) batteries, which can recharge faster than you can use them — one and a half hours of recharging for every two to four hours of battery life. Unfortunately, Apple currently makes NiHy batteries only for the PowerBook Duos, and they're not offered by any third-party vendors for the PowerBook 140, 145, 160, 170, or 180 — yet.

The Madson Line will be introducing a charger capable of charging the familiar NiCad batteries used in non-Duo PowerBooks as well as the new NiHy batteries. Madson claims that this new charger will fully charge either type of battery in about two hours.

Another new technology that should be available by the time you read this article is *zinc-air*. Zinc-air batteries use the oxygen in the air to create power,

mix of fast charging and trickle charging. Neither the Apple PowerBook 140/170 Battery Recharger nor the Lind Full-Cycle Charger/Conditioner can fast-charge a battery fully — if they did, the battery could be damaged by overheating. The Madson System 90 Charger, on the other hand, uses sophisticated sensors and a microprocessor that enable it to fast-charge a battery from start to finish without overheating and dramatically reduce the charging time.

The Apple PowerBook 140/170 Battery Recharger can charge two batteries simultaneously, but it does so by alternating spurts of current between the two batteries. When only one recharging slot is filled, the charger takes five hours to fully charge a battery. If both slots are filled, it will take ten hours to charge both batteries — each will be only half-charged at the end of five hours. Apple has fixed this problem with its new Duo battery charger, which completely charges one battery before charging the second one.

Another disadvantage of the Apple PowerBook 140/170 Battery Recharger is that it does not come with

Figure 2: What Affects Battery Life?

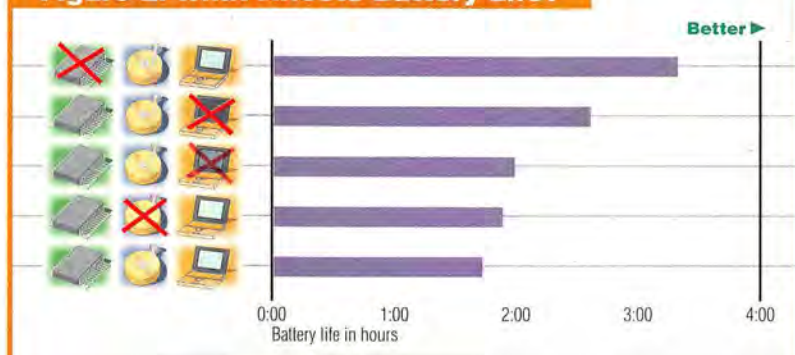


Figure 2: A PowerBook's battery has three major demands on its power: from its microprocessor, its hard drive, and its screen backlighting. To discover which causes the biggest power drain, we tested each in turn — but first we prevented the microprocessor from resting, kept the hard drive spinning, and turned the backlighting on at full brightness to discover the battery life per charge under the most demanding conditions. The battery lasted less than two hours. We then selectively turned off the hard drive, dimmed the backlighting, turned the backlighting off completely, and rested only the microprocessor and discovered that the microprocessor is the most power-hungry component. The lesson: Don't disable your PowerBook's system-rest feature unless absolutely necessary, and slow the microprocessor down to 16 megahertz whenever possible.

an AC adapter — you can't use the Apple PowerBook 140/170 Battery Recharger and your PowerBook simultaneously with AC power unless you buy an extra PowerBook AC adapter, which costs \$65.

The single-slot Lind Full-Cycle Charger/Conditioner takes about four hours to fully charge a single battery. It's a great addition to your personal PowerBook tool kit, but it was designed to accommodate a BTI battery, which is $\frac{1}{6}$ inch longer than an Apple PowerBook battery. Because the Apple battery doesn't fit well, it's possible to insert it so it doesn't make a proper connection with the contacts in the Full-Cycle Charger/Conditioner, so an Apple battery can appear to be trickle charging but in fact not be charging at all. The BTI MC-170 battery is a very tight fit — so tight that it's sometimes exceptionally difficult to remove. Another problem is that the unit's LED light that indicates when the battery has finished fast charging and the charger has switched to trickle-charge mode remains lit even when there is no battery in the charger.

The Madson System 90 Charger in its three-battery configuration (the System 90 Charger is also available in one- and six-battery configurations) can fully charge three batteries in three hours. It has an LCD screen that can constantly show voltage readouts and provide information about how much

and they're light and long-lived. Although no internal PowerBook batteries that use zinc-air technology exist yet, AER Energy Resources claims that its Power 20 Rechargeable Battery System (\$649) — a 6-pound battery pack — can power your PowerBook for 20 hours, or ten times as long as Apple's NiCad battery can. AER Energy Resources, Inc., 1500 Wilson Way, Suite 250, Smyrna, GA 30082; 800-769-3720 or 404-433-2127.

If you want longer life per charge from more familiar technology, you can get an external battery pack to lug around. Interex, for example, makes the PowerToGo! (3 pounds), which offers 6 to 12 hours of use from eight D-sized alkaline batteries — those touted by the Energizer bunny — for \$89.95. Interex Computer Products, 2971 S. Madison, Wichita, KS 67216; 316-524-4747.

Lind Electronic Design offers an external D-sized battery pack as well as an external battery pack that uses sealed-lead-acid technology — the same technology used for the battery in

the original Mac Portable and the recently discontinued PowerBook 100 — which offers as much as four times the life of your PowerBook battery per charge.

For the cost-conscious, Alexander Batteries is now shipping a replacement battery that has performance comparable with that of the older Apple PowerBook 140/170 battery — and it costs only \$51.30. Alexander Batteries, Inc., 50 Tannery Road, Unit 2, North Branch, NJ 08876; 800-221-0019 or 908-534-1177.

Finally, for those who tote their Mac into the great outdoors, Microtech offers SolarPOWER, a solar panel that can help extend the life of your PowerBook battery, for \$189. SolarPOWER supplements your machine's internal battery, helping your PowerBook keep going and going and going and going and . . . Microtech International, 158 Commerce Street, East Haven, CT 06512; 800-626-4276 or 203-468-6223.

— Darryl Chan

Inside the Engine

The BTI MC-170 and new Apple NiCad batteries employ Panasonic cells, which provide more energy than do the older Apple NiCad batteries, which use Sanyo cells.

Two parallel columns of five cells in series provide 7.2 volts when fully charged.

For each column, Apple has an internal thermistor, a temperature-sensing protective device for detecting and preventing overheating. The BTI MC-170 battery has only one internal thermistor on one of its two columns.

A PowerBook battery contains ten power cells, the quality of which dictates the quality of the battery. When the PowerBooks were first introduced, in October 1991, Apple's batteries were made with cells from Sanyo rated at 2.4 Ah (ampere-hours, a measurement of a cell's storage capacity). Beginning with the PowerBook 145, 160, and 180, Apple switched to higher-density cells from Panasonic, which were rated at about 2.8 Ah. This difference of 16.7 percent was confirmed in our testing.

energy each battery can hold, allowing you to easily test and analyze your batteries on a regular basis. Although the System 90 Charger's features are extensive, its high price — even for the single-slot configuration — makes it overkill for a single user.

Honorable Discharge

Although their faster recharging speed is a convenience, what really sets the Lind Full-Cycle Charger/Conditioner and the Madson System 90 Charger apart from the Apple PowerBook 140/170 Battery Recharger is their ability to completely discharge a NiCad battery before recharging it. The Apple PowerBook 140/170 Battery Recharger can only

charge a battery — you have to use your PowerBook to discharge it.

Discharging, or *conditioning*, your battery is critical for getting a maximum battery charge — a battery that's not properly conditioned may experience a *memory effect* — that is, it may "remember" at what level of energy its last recharging began and "think" that level is the limit of its capacity. If, for example, you work at your desk with your PowerBook plugged in to its AC adapter, unplug it and carry it down the hall for a ten-minute meeting, and then return to your desk and go back to AC power, you risk the dreaded memory effect. Although modern NiCad technology reduces this effect, it can still take a toll on your

battery's capacity and total longevity.

To test how susceptible the Apple battery is to the memory effect, we performed the "brief meeting" scenario we just described — ten minutes' use and then a trickle charge back up to full capacity. After we'd repeated this usage pattern 50 times, the battery life per charge dropped precipitously to a mere 15 minutes. The message is clear: You should completely discharge your PowerBook battery as often as possible.

The Lind Full-Cycle Charger/Conditioner and the Madson System 90 Charger can each repair a memory-effect-plagued battery and help ensure that the effect doesn't happen in the first place by discharging the battery completely before recharging it. The Lind Full-Cycle Charger/Conditioner completely repaired our test battery, despite its severe memory effect, with only two five-hour charge/discharge cycles.

How We Tested

MacUser Labs and ZD Labs prepared dozens of user profiles that required high, medium, and low power-consumption settings for the three major battery-draining components of our test PowerBook 170: the processor, the screen backlighting, and the hard-disk drive. We varied controls as well as configurations — creating a RAM disk and unmounting the internal hard drive, adjusting the screen's brightness slider, and using the System 7.0.1 Portable control panel and Connectix's CPU to control different components. To find the maximum and the minimum battery life per charge, we also created configurations with all components functioning at their lowest settings and with all components always fully active.

To allow us to emulate various usage patterns, ZD Labs developed ZDigit, a PC-controlled, solenoid-based mechanism that depresses predetermined PowerBook keys at adjustable intervals as part of repeatable and timed cycles of usage, idleness, and sleep. ZD Labs also developed custom testing software, MacDrain, to accurately time battery life cycles.

In testing what the battery-draining effect of the PowerBook 170's 68030

On the other hand, to completely correct the same degree of memory effect, using the Apple PowerBook 140/170 Battery Recharger, we had to charge the battery for 24 hours, drain it in a PowerBook, and then charge it for another 24 hours. If you have an Apple PowerBook 140/170 Battery Recharger and are forced to use your PowerBook as a discharging station, take a look at Connectix's CPU (Connectix PowerBook Utilities), which has a convenient quick-drain feature that makes the task easier. But remember: A PowerBook shuts itself off well before the battery is completely discharged. The deep-discharge function on both the Lind Full-Cycle Charger/Conditioner and the Madson System 90 Charger takes a further ten minutes to drain the battery completely, but it keeps your batteries in tip-top shape.

Ongoing maintenance of your batteries is easier if you give them the

right start in life. A NiCad battery must be properly preconditioned, or *formed*, before it is first used, to ensure that it will hold its maximum charge. Forming requires breaking in the batteries with two 12-hour charges, with deep discharges in between. Apple preconditions all of its batteries, so you have to worry only about those from third-party vendors. The BTI batteries we tested, for example, did not come ready for use. The unformed MC-170s that we charged for only three to four hours never rose above 30 percent of their optimal capacity. We recommend the Lind and the Madson chargers for their deep-discharge function, which makes forming batteries fast and easy.

Another maintenance issue is whether you can damage a battery by leaving it in a charger for an extended period. We noticed no resulting performance degradation after leaving a battery in a charger for 50 hours. Apple

and BTI both use thermistors in their batteries to detect and prevent overheating (see the "Inside the Engine" sidebar).

To Maximize, Minimize

Aside from maximizing a battery's charge, minimizing the drain on the battery is the most important factor in getting more power out of your PowerBook. Since the PowerBook's introduction, there has been a lot of speculation about whether the hard drive or the screen's backlighting is responsible for the biggest energy drain. We were surprised to find that neither is the prime culprit.

For our testing, we first maximized all factors — we had the hard drive constantly spinning, the screen's backlighting turned all the way up, and the microprocessor set to Don't Rest — to get a worst-case scenario of an hour and three quarters of battery life for a fully charged, well-conditioned Apple

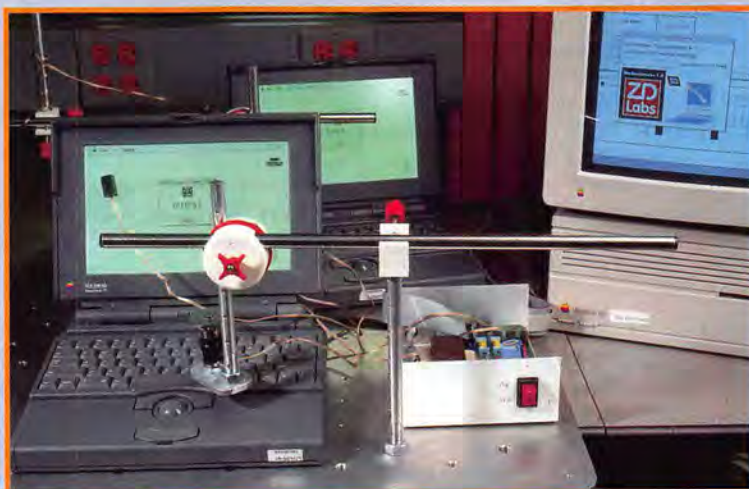
microprocessor is, we ran each profile with the processor Rest setting on and then off. Specifying Don't Rest in a dialog box accessible through the Portable control panel disables the PowerBook's power-saving *system-rest* feature, which slows down the processor (instead of putting the entire PowerBook to sleep) from 25 to .0006 megahertz when there is no activity after a brief period of time. Disabling this feature is useful when you're using software that requires background processing, such as fax preparation, but it puts a tremendous drain on battery power.

To test what portion of battery drain can be blamed on backlighting, we set the external control slider to maximum, dim, and off. We discovered that the new PowerBook Duos not only have a smaller — and less power-hungry — light source but also have a 35-percent-more-efficient *light pipe* between the source and the screen, so you can use less energy and enjoy the same brightness level.

Although common sense told us that it takes more energy to spin a hard-disk drive than not and although we knew that a drive consumes more power when starting — *spinning up* — than when

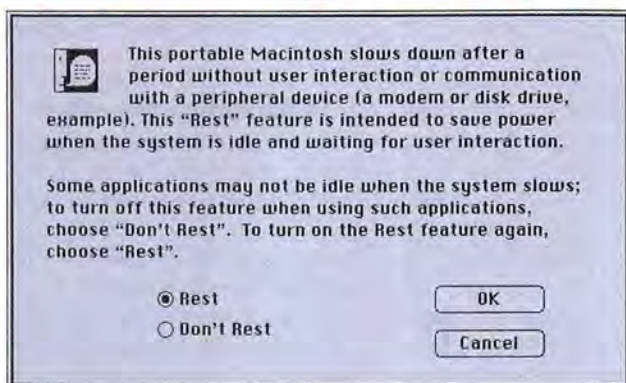
running, it took testing in the Labs to find the break-even point between letting the drive spin constantly and letting it spin down when not in use and spin up again when reading or writing a file. We discovered that whenever the drive

spins for longer than 15 seconds, it's wasting energy. However, spinning your hard drive up and down every 15 seconds or less is frustrating and time-consuming — the best solution is to use a RAM disk instead.



To test the battery life per charge of notebook and laptop computers, technicians at ZD Labs developed ZDigit, an automated testing device that imitates the way users work.

Figure 3: Hidden Dangers — and Opportunities



In System 7.0.1's Portable control panel, a hidden dialog box — hold down the Option key and click on the word *Automatic* to make it appear — lets you turn off the system-rest feature. Turning it off is useful when you're using applications that demand full-speed background processing, but it rapidly drains your battery.



The Battery DA provided with System 7.0.1 gives you access to the Power-Saver mode, which slows your microprocessor to 16 megahertz, saving battery power.

System 7.1's PowerBook control panel gives you access to this dialog box when you hold down the Option key while clicking on the Options button. Here you can disable Processor Cycling — equivalent to the system-rest feature of System 7.0.1 — and reduce the speed of the microprocessor.

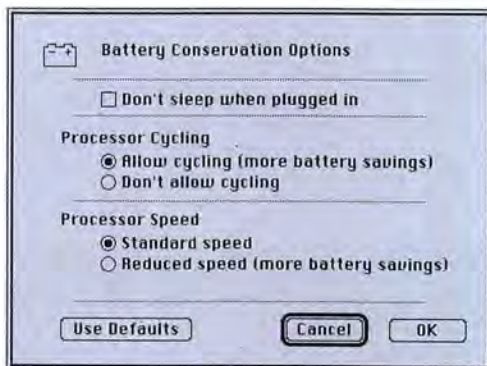


Figure 3: System 7.0.1, used on the first generation of PowerBooks, and System 7.1, used on the PowerBook 160 and 180 and the Duos, differ in how they give you access to microprocessor-speed controls.

battery (see the "How We Tested" sidebar). We then minimized each factor, one at a time, to see its individual effect on the overall power drain (see Figure 2).

In order to completely eliminate the hard drive's effect on battery drain, we created a RAM disk, loaded system-software and application files onto it, and unmounted the internal hard


drive. We noticed a 10-percent improvement over our worst-case battery performance when we used the RAM disk instead of having the computer access the internal hard drive. We also tested the energy drain of the floppy-disk drive and discovered that there's no significant advantage — or disadvantage — in using the floppy drive instead of the hard drive.

Although a PowerBook with a RAM disk can be used anywhere, our next test — with the backlight completely off — simulated PowerBook usage in a well-lighted area, such as in an outdoor cafe or under an airliner's overhead light. Turning the backlight completely off increased the battery life per charge by 50 percent. Dimming the backlight also helped conserve power but increased the battery life by only 15 percent.

The real surprise of our testing was that the biggest power hog is not the mechanics of the hard drive or the light source in the screen but the heart of the PowerBook itself: its 68030 microprocessor. Average users normally don't notice the processor's hunger for power, because Apple's system-rest default setting slows the processor to a crawl when it's not in use. This default setting — Rest mode — slows the processor from 25 million cycles per second (25 megahertz) to 60 cycles per second — a significant decrease. Although Rest mode is a valuable power-saving feature, it can seriously degrade the performance of some applications that use background processing — fax-modem software, for example.

To prevent the microprocessor from going into Rest mode, go to the Portable control panel under System 7.0.1, hold down the Option key, and click on the word *Automatic* in the phrase *Minutes Until Automatic Sleep*. A dialog box appears, letting you choose Rest or Don't Rest. Under System 7.1, you can achieve the same result by holding down the Option key when you choose Options in the PowerBook control panel and then clicking on the Don't Allow Cycling radio button in the dialog box that appears (see Figure 3). The Don't Rest and Don't Allow Cycling settings, which keep the processor always on, cut battery life in half.

If you have a PowerBook 145, 160, 170, or 180 or a Duo, you can also save power by slowing the processor down to 16 megahertz when you're not using AC power. You do this by



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MacWEEK August 3, 1992

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"Actions that a mail user performs frequently—creating a new message and reading the latest message—are always a click away."

About the competition:

"Microsoft Mail and WordPerfect® Mail both suffer from inordinately complex cross-platform setup processes; understanding these systems is a major commitment."

"QuickMail was the only package whose mail server crashed during testing. . . (its) spotty reliability for Macs and PCs was the primary impetus for the upgrade . . . so this evidence of continued problems concerns us."

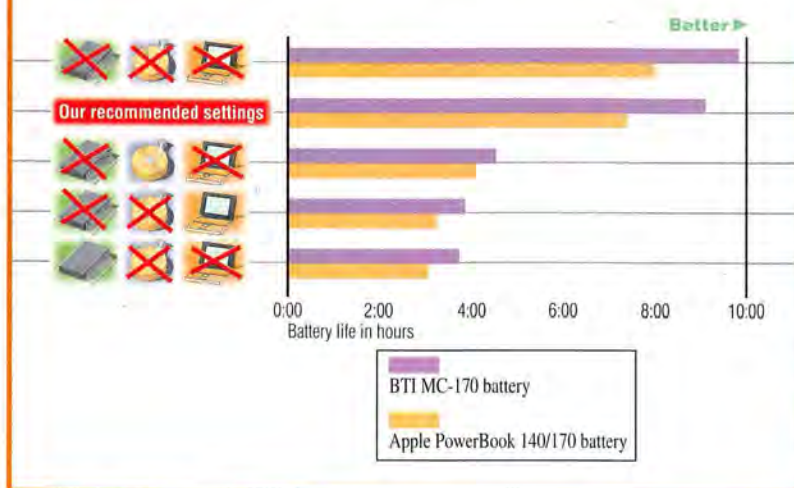
Lotus cc:Mail for Macintosh

Figure 4: Working 9 to 5

Figure 4: Using ZDigit, ZD Labs' automated testing device that simulates the actual usage patterns of a typical PowerBook user, we tested both the older PowerBook 140/170 battery and the BTI MC-170 battery, which uses advanced NiCad technology similar to that used in the batteries provided with the new PowerBook 160 and 180. ZDigit was set to imitate a user who types 20 percent of the time, rests between key-strokes 20 percent of the time, and puts the PowerBook to sleep 30 percent of the time.

Using combinations of a processor setting of Rest or Don't Rest, the hard

drive on or off, and backlighting off or bright, we compared each battery's performance with our recommended optimal settings: the microprocessor in 16-megahertz Power-Saver mode and resting after five seconds of inactivity (set with Connectix's CPU), files and applications on a RAM disk, and screen backlighting set at a minimum. With these settings, we were able to extend the battery life per charge to a level exceeded only by the unrealistic configuration of never letting the processor out of Rest mode, completely unmounting the hard drive, and turning off all backlighting.



using the Battery DA under System 7.0.1 and via the PowerBook control panel under System 7.1.

Software Conservation

In System 7.1, Apple has provided more-automated control over battery-draining factors with the new PowerBook and PowerBook Display control panels. These control panels are so automated, however, that you lose the ability to set the microprocessor and hard-drive sleep times independently, so several third-party vendors are introducing products that give you more control over configuring and controlling your PowerBook settings. Connectix's CPU was the only product of its type shipping at the time of our testing, but we saw beta versions of After Hours' GUM (Guy's

Utilities for the Macintosh) and ALSoft's Utilities for the PowerBook, which promise similar control over the processor, hard drive, and backlighting. (Note: GUM is now being sold by Symantec and is called Norton

Essentials for PowerBook.)

A key feature of CPU is its ability to configure settings for use in different situations. It offers five preconfigured settings, among them one for the office and another for when you're on the road. The Office setting optimizes the PowerBook for use with AC power — using maximum backlighting and not spinning the hard drive down for long periods. To attain maximum battery life per charge in Travel mode, CPU turns down the backlighting, spins down the hard drive, and puts the processor into Rest mode after a short amount of inactivity. The program also has convenient hot keys for instantly turning down backlighting or spinning down your hard drive and puts useful information onto the menu bar about the projected battery life, current processor speed, date, and time.

Optimal Setting

After testing a variety of PowerBooks in a broad range of usage patterns, we came up with a series of recommendations guaranteed to squeeze the most life per charge out of your PowerBook battery. First, buy as much RAM as you can afford. Then, before you unplug your PowerBook from its AC adapter to take it on the road, create as large a RAM disk as your RAM will allow — remember to leave enough room in system RAM for running your favorite applications — and then fill the RAM disk with the applications and files you plan to use

CellMate

The exclusive *MacUser* utility CellMate lets you put your PowerBook to sleep from within any application. The unobtrusive icon, which looks like a D-sized battery, rests in the corner of your menu bar — as power drains, the gray fill in the icon decreases. A lightning bolt appears next to it when your PowerBook is plugged in to AC power.

CellMate also lets you know if your PowerBook modem is turned on — a handy reminder to turn your communications program off and conserve

energy, because the internal modem sucks battery power quickly. You can invoke Sleep mode either with a Command-Option-click on the icon or via a pull-down menu. CellMate bypasses the annoying dialog box that warns users about losing network connections.

CellMate is available exclusively on ZiffNet/Mac: Simply download CELMAT.GPT from Library 3 of the Download & Support Forum (GO ZMC:DOWNTECH).

— Ben Templin

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The Bottom Line

You can extend the life per charge of your PowerBook battery in several ways — but first make sure your battery still has enough life to save. If you've had your PowerBook 140 or 170 since soon after its introduction and if you use it frequently, it may be time to replace your batteries, because a NiCad battery has a total life of only about 1,000 hours at maximum usage. Also, you can now get more for your battery dollar: Most third-party PowerBook batteries, as well as the new batteries that Apple quietly introduced along with the PowerBook 145, 160, and 180, can last about 17 percent longer per charge than the earlier ones.

For extending the overall life of your batteries and ensuring their best performance per charge, we recommend a charger that has a deep-discharge function. For individuals, the **Lind Electronic Design Full-Cycle Charger/Conditioner** (\$189 list, \$160 street) is an important addition to every PowerBook tool kit, although its one-recharging-slot design makes it less convenient than the slow but inexpensive **Apple PowerBook 140/170 Battery Recharger** (\$89 list, \$85 street; the Macintosh PowerBook AC Adapter is an additional \$65 list, \$60 street). In addition to being slow, the PowerBook 140/170 Battery Recharger can't deep-discharge your batteries.

For the busy PowerBook-rich office, choose the **Madson Line System 90 Charger** (\$537 direct). The System 90 Charger is the fastest charger of the ones we tested and sports a convenient LCD progress readout — but it's expensive.

Many new PowerBook utility-software packages will soon be

available, but for now, Connectix's **CPU** (Connectix PowerBook Utilities; \$99 list, \$48 street) gives you a fine level of control and many useful features at a reasonable price. CPU — or a similar package — is an essential supplement to Apple's System 7.1 PowerBook-control software.



The Lind Electronic Design Full-Cycle Charger/Conditioner (left) ensures that your PowerBook batteries remain stronger longer. The Madson Line System 90 Charger (right) is faster and can charge multiple batteries simultaneously — but at a price.

in that work session. This is certainly not the least expensive way to maximize your battery life, but short of working outdoors or under bright lights with your screen's backlighting turned off, it's one of the most effective. Don't forget to save occasionally, either to your hard disk or to a floppy disk.

Using a RAM disk minimizes disk access but doesn't totally eliminate it. Most applications were not designed for PowerBooks and occasionally access the hard drive for fonts, preference files, and other needs. Unfortunately, the ubiquitous Microsoft Word drained the battery faster than any word processor we tested. If you can't afford extra RAM for a RAM disk, you can still use Apple's Portable (System 7.0.1) or PowerBook (System 7.1) control panel for spinning down your hard drive frequently to avoid unnecessary battery drain. Although spinning down your internal drive every 15 seconds or less saves battery life per charge, it can wear your patience: We suggest the happy compromise of

spinning down your hard drive after two minutes.

Also, turn down the backlighting as low as possible and make sure your processor is set to Rest — and be sure to deactivate AppleTalk in the Chooser to minimize the energy draw to the serial port and switch your processor speed to 16 megahertz.

Although Apple claims that its battery can last for two to three hours per charge, we were able to keep a PowerBook running, with just a single battery, throughout a cross-country flight — including 30-percent system-sleep time during the meal. To achieve the optimum setting, we turned down the power-hungry screen backlighting to its minimum setting, kept all of our files and applications on a RAM disk, and used Connectix's CPU to order the microprocessor to slow down to Rest mode after five seconds of inactivity (see Figure 4).

We could not have accomplished this transcontinental, portable-computing success if we hadn't used well-formed, fully conditioned, high-

capacity batteries. Look to the "Bottom Line" sidebar for help in choosing a charger that will keep your PowerBook batteries happy, healthy, and productive.

Bruce I. Berkoff is the Macintosh-platform manager, environmental-testing manager, and unofficial physicist-in-residence at ZD Labs. **Michael Mathog**, a project leader at ZD Labs, managed the testing for this report.

Table 1 Criteria

Full-discharge mode — Can the charger fully discharge a battery before recharging it?

Number of recharging slots — The number of batteries the charger can charge at one time.

Time for full charge — The time it takes to fully charge one battery.

Rate of fast charge — The amount of current the charger supplies to the battery before switching to a lower-amperage trickle charge.

Fast-charge percent — The percentage of the full charge that the charger completes in fast-charge mode before switching to a slower mode.

continues ►

Efi

*"Scanned in
too light"*



*"Too blue,
use the
color filter"*



*"No color,
pump up the
saturation"*



*"Perfect.
Great proof.
Print it."*

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to order Cachet or find the
reseller nearest you.

Electronics for Imaging, Inc.

Cachet system requirements: Mac LC with math coprocessor,
Mac II or Quadra family. Hard disk, 5MB RAM (8MB
recommended). 8 to 24-bit video card. Color monitor, 13" or
larger. System 6.05 or later. This ad was produced using Cachet.




CIRCLE 72 ON READER SERVICE CARD.



Cachet includes EfiColor™
Color Management System



Table 1: Features of PowerBook Battery Chargers

			
	Apple PowerBook 140/170 Battery Recharger ★★½	Lind Full-Cycle Charger/Conditioner ★★★½	Madson System 90 Charger ★★★★
List price	\$89	\$189	\$537 (3 recharging slots)*
Street price	\$85	\$160	\$537 (direct)
Pros	Inexpensive. Charges 2 batteries simultaneously. Portable.	Deep-discharge function. Charges a single battery faster than does the Apple recharger. Portable.	Fastest charger. Charges 3 batteries in the same time as it takes for 1 battery. Deep-discharge function. Optional adapter can charge other sizes of NiCad batteries. LCD diagnostic readout.
Cons	Slow. No deep-discharge function. Takes twice as long to charge 2 batteries as it does to charge 1. Requires Macintosh PowerBook AC Adapter (\$65).	Charges only 1 battery at a time. Fast-charge-complete indicator light remains on when the battery slot is empty.	Very expensive. Not portable.
Features			
Full-discharge mode	no	yes	yes
Number of recharging slots	2	1	3*
Time for full charge	5 hours†	4 hours	3 hours
Rate of fast charge	1 amp	1 amp	.9 amp
Fast-charge percent	50 percent§	80 percent°	100 percent**
Company	Apple Computer, Inc. 20525 Mariani Blvd. Cupertino, CA 95015 800-776-2333 408-996-1010 408-974-6726 (fax)	Lind Electronic Design, Inc. 6414 Cambridge St. Minneapolis, MN 55426 800-659-5956 612-927-6303 612-927-7740 (fax)	The Madson Line P.O. Box 338 Corte Madera, CA 94976 800-851-1551 415-927-3600 415-927-4661 (fax)

*A 1-slot version is available for \$295 and a 6-slot version for \$827.

†Takes 10 hours to fully charge 2 batteries.

§Fast-charges to 50 percent, medium-charges to 80 percent, and trickle-charges to 100 percent.

°Fast-charges to 80 percent and trickle-charges to 100 percent.

**A built-in sensor enables a fast charge to 100 percent.

If this reminds you of your PowerBook after an hour or so, make its battery charge last up to twice as long with The Norton Essentials™ for PowerBook. It increases battery charge, makes your PowerBook easier to use, and keeps files synchronized – all without sacrificing performance. To learn more, dial FAST FAX 1-800-554-4403.*



*Option 1, document 461. Norton Essentials™ is a trademark of Symantec Corporation. ©1993 Symantec Corporation.

Directory of PowerBook Power Tools
Batteries
AER Energy Resources, Inc.

1500 Wilson Way
Suite 250
Smyrna, GA 30082
800-769-3720
404-433-2127
404-433-2286 (fax)

Power 20 Rechargeable Battery System, \$649 (requires the Apple PowerBook Adapter, \$99)

Alexander Batteries, Inc.

50 Tannery Road
Unit 2
North Branch, NJ 08876
800-221-0019
908-534-1177
908-534-1614 (fax)
Replacement battery, \$51.30

Apple Computer, Inc.

20525 Mariani Blvd.
Cupertino, CA 95015
800-776-2333
408-996-1010
408-974-6726 (fax)
PowerBook 140/145/160/170/180 Rechargeable Battery, \$69
PowerBook Duo Battery, \$69

BTI (Battery Technology, Inc.)

5700 Bandini Blvd.
Commerce, CA 90040
800-982-8284
213-728-7874
213-728-7996 (fax)
MC-170, \$69.95

Interex Computer Products

2971 S. Madison
Wichita, KS 67216
316-524-4747
316-524-4636 (fax)
PowerToGo!, \$89.95

Lind Electronic Design, Inc.

6414 Cambridge Street
Minneapolis, MN 55426
800-659-5965
612-927-6303
612-927-7740 (fax)
Auxiliary Battery Pack, \$189.95
External Battery Pack (8 D-sized), \$99.95

Chargers and Conditioners
Alexander Batteries, Inc.

50 Tannery Road
Unit 2
North Branch, NJ 08876
800-221-0019
908-534-1177
908-534-1614 (fax)
Charger, \$59.95
Charger/conditioner, \$99.95

Apple Computer, Inc.

20525 Mariani Blvd.
Cupertino, CA 95015
800-776-2333
408-996-1010
408-974-6726 (fax)
PowerBook 140/145/160/170/180 Battery Recharger, \$89
PowerBook Duo Recharger, \$89
Macintosh PowerBook AC Adapter, \$65

Applied Engineering

3210 Beltline Road
Dallas, TX 75234
800-554-6227
214-241-6060
214-484-1365 (fax)
Charger/conditioner, \$160
Automotive battery adapter, \$75

ComputerCare, Inc.

420 N. 5th Street
Suite 1180
Minneapolis, MN 55401
800-950-2273
612-371-0061
612-371-9342 (fax)
Charger/conditioner, \$199
Conditioner, \$99

Lind Electronic Design, Inc.

6414 Cambridge Street
Minneapolis, MN 55426
800-659-5956
612-927-6303
612-927-7740 (fax)
Full-Cycle Charger/Conditioner, \$189
Automotive Battery Adapter, \$99.95

The Madson Line

P.O. Box 338
Corte Madera, CA 94976
800-851-1551
415-927-3600
415-927-4661 (fax)
System 90 Charger (one slot), \$295
System 90 Charger (three slots), \$537
System 90 Charger (six slots), \$827

Power Accessories
Microtech International, Inc.

158 Commerce Street
East Haven, CT 06512
800-626-4276
203-468-6223
203-468-9447 (fax)
SolarPOWER, \$189 (solar-panel supplementary power source)

Utilitron, Inc.

P.O. Box 811
Allen, TX 75002
800-428-8766
214-727-2329
214-727-2329 (fax)
PowerSwap, \$39.95 (enables battery swap without shutdown)

PowerBook Utilities
ALSoft, Inc.

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PowerBook and SCSI Display Adapters

Now you can escape the small screen of your PowerBook or compact Mac — but freedom may not be worth the cost.

If you own a PowerBook or compact Mac, there may be times when you wish your screen were bigger or in color. Because the first generation of PowerBooks — the 100, 140, 145, and 170 — doesn't have ports for external monitors and because many compact Macs — the Plus, Classic, and Classic II — lack expansion slots into which a display adapter can be placed, enterprising companies have stepped in to fill the bill. In December 1992, when we took our first look at video adapters for PowerBooks and compact Macs ("Breaking Out to the Big Screen: PowerBook and SCSI Display Adapters," December '92, page 172), we discovered this new product category to be undergoing growing pains. This month we look at the latest crop of PowerBook and SCSI display adapters — the best are better, but prices remain high.

PowerBook and SCSI display adapters are available in three configurations: internal cards that fit into the PowerBook's RAM slot, external boxes that connect the SCSI port on a PowerBook or compact



Figure 1: In the fast-changing world of video adapters, five new products have been introduced and one has been dropped from the race: RasterOps has discontinued its ClearVue/SD21 (upper left).

Mac and an external monitor, and monitors that connect directly to the SCSI port. Of the six display adapters tested for this month's report, two — the LifeTime Video+ and the Mirror PowerVision — fit inside a PowerBook 140, 145, or 170. Each is capable of 8-bit display (256 colors or shades of gray) when connected to a monitor displaying the standard 13-inch video resolution of 640 x 480 pixels, but the PowerVision is the only internal video adapter capable of 4-bit (16-color) or 1-bit (monochrome) display — a useful capability in word-processing or spreadsheet work, when fast scrolling is more important than a colorful display.

The other four display adapters connect through the SCSI port. Two — the Lapis PowerBase I and the Aura ScuzzyView — are external boxes compatible with a variety of monitors. The PowerBase I supports monochrome monitors with pixel resolutions of 640 x 480 (13- and 14-inch monitors), 640 x 870 (15-inch full-page displays), 832 x 624 (16-inch monitors), 1,024 x 768 (19-inch monitors), and 1,152 x 870 (21-inch monitors). The ScuzzyView supports color and gray-scale monitors at 1, 4, and 8 bits at a pixel resolution of 640 x 480 — an optional upgrade (at a price not yet set at press time) can increase 8-bit resolution to 1,024 x 768 pixels. The



PowerBook video adapters have improved since our December 1992 report, but they're still expensive.

Figure 2a: Scrolling Speed on a Monochrome Monitor

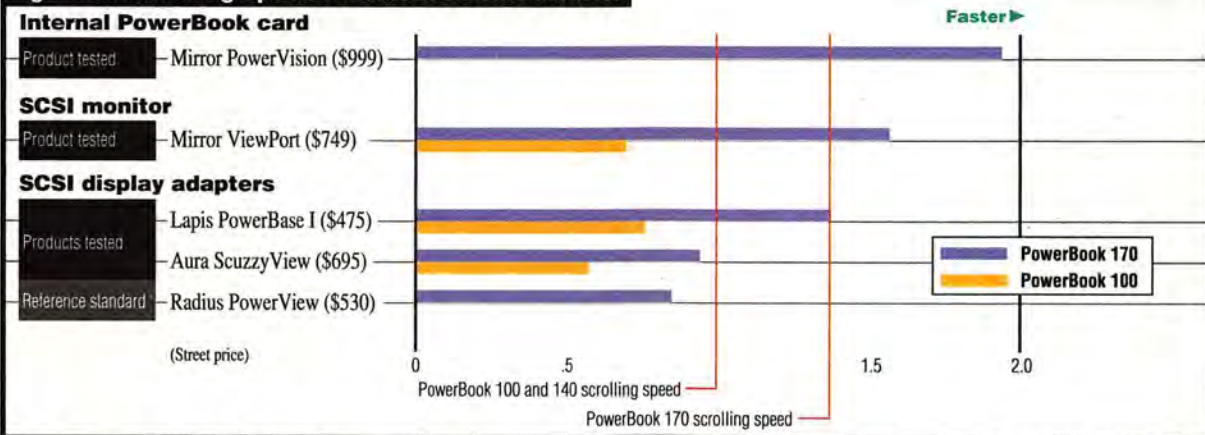


Figure 2a: We tested the video efficiency of the internal PowerBook and SCSI adapters by scrolling through a ten-page Microsoft Word 5.0 document. The results were then compared with the performance on the internal screen on the PowerBook

100 and 140. The Mirror PowerVision actually increased the scrolling speed on the PowerBook 170's internal screen by 40 percent when the external monitor was set as the startup monitor in monochrome mode.

Figure 2b: Scrolling Speed on a Color Monitor

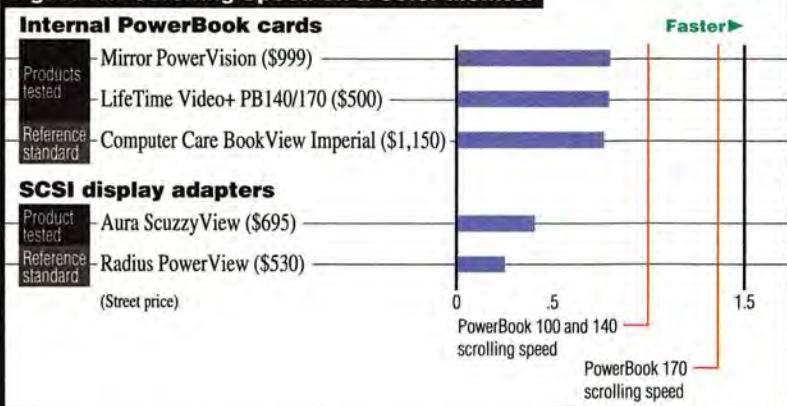


Figure 2b: When we used the SCSI video adapters on an Apple 13-inch RGB monitor with 8-bit color, the performance penalty was significant. Although the scrolling speed of a PowerBook 170 was slowed by 40 percent with the internal video cards, a PowerBook 170 with the color SCSI adapters was even slower. However, the internal PowerBook cards are also much more expensive. Seeing your screen in color is nice, but the performance penalty may be too great. The Mirror PowerVision is the only internal video card that can also display in monochrome mode — useful when speed is more important than color.

remaining two products — the Mirror ViewPort (a 15-inch full-page display) and the RasterOps ClearVue/SD21 (a 21-inch display) — are monochrome monitors with built-in video circuitry. [At press time, RasterOps had decided to discontinue the ClearVue/SD21; its test results were consequently dropped from our charts. — Ed.]

Internal Problems

All four SCSI display adapters were easy to install, although the Mirror ViewPort's documentation was less than clear about how to set the SCSI address and termination — a problem if you have several devices on your SCSI chain.

Installing the internal PowerBook video adapters was another matter — it's not a task for the novice, and unauthorized opening of your PowerBook voids Apple's warranty. If you buy a Mirror PowerVision or a LifeTime Video+ adapter, we recommend that you have it installed by your dealer.

Of the two internal adapters, the LifeTime Video+ is the easier to install — LifeTime estimates that a dealer should charge about \$50. However, the Video+'s cumbersome design prevents the PowerBook's back panel from closing.

The Mirror PowerVision is better designed. Its video connector cables snake under a ribbon cable in the

left hinge of the PowerBook and connect to the internal card on the RAM-expansion slot. The PowerVision comes with a replacement hinge cover that houses the 15-pin video connector. Mirror offers installation for \$100 plus shipping and handling. In case you're Mac-savvy, Mirror provides a manual on how to install the PowerVision yourself, along with all the necessary tools and an instructional videotape.

The Performance Penalty

Although design and ease of installation are important, performance — the speed of the processor plus the efficiency of the video adapter — is key.

Table 1: Pros and Cons

	Aura ScuzzyView	Lapis PowerBase I	LifeTime Video+ PB140/170	Mirror PowerVision	Mirror ViewPort
List price	\$695	\$595	\$795	\$999	\$749
Street price	\$695 (direct)	\$475	\$500	\$999 (direct)	\$749 (direct)
Type	SCSI adapter	SCSI adapter	Internal PowerBook card	Internal PowerBook card	Full-page display
Pros	Excellent technical support. 30-day money-back guarantee. Supports 1-, 4-, and 8-bit color.	Inexpensive. Supports 13-, 15-, 16-, 19-, and 21-inch monitors. 30-day money-back guarantee.	Color-capable. Fast. 30-day money-back guarantee.	Well designed. Fast. 30-day money-back guarantee. Supports 1-, 4-, and 8-bit color and gray scale.	Inexpensive. 30-day money-back guarantee.
Cons		1-bit monochrome only.	Incompatible with RAM disk. Supports only 8-bit color and gray scale.	Expensive.	1-bit monochrome only.
Company	Aura Systems, Inc. 6150-A Yarrow Dr. Carlsbad, CA 92009 800-241-2872 619-438-7730 619-438-7758 (fax)	Lapis Technologies, Inc. 1100 Marina Village Pkwy., Ste. 100 Alameda, CA 94501 800-435-2747 510-748-1600 510-748-1645 (fax)	LifeTime Memory Products, Inc. 305 17th St. Huntington Beach, CA 92648 800-233-6233 714-969-2421 714-960-0638 (fax)	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)	Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 800-654-5294 612-633-4450 612-633-3136 (fax)

We were disappointed to discover that none of the products is compatible with Apple's virtual memory — a System 7 feature that allows you to turn part of your hard disk into extra RAM. Moreover, the Video+ PB140/170 cannot be used with a RAM disk — you can't speed up performance and conserve battery life by converting your PowerBook's RAM into temporary storage.

We tested all the display adapters by timing how long it took to scroll a ten-page Microsoft Word 5.0 document, which provided a good indicator of how efficiently they perform day-to-day operations. The PowerBooks with the Mirror PowerVision were the fastest (see Figure 2). As expected, the PowerVision was significantly slower in 8-bit color, because color requires that eight times as much video information be processed.

We used a MacroMind Director document and a QuickTime document to test each color-capable

adapter for animation capability. The PowerVision displayed everything correctly and played the QuickTime movie smoothly but slowly.


The LifeTime Video+ PB140/170 was only slightly slower than the PowerVision but can display only in color or gray scale. The Video+ had no problems with the animation test, but it could not play the QuickTime movie smoothly. Both internal adapters performed comparably with the Computer Care BookView Imperial (the recommended internal adapter in our December 1992 report), but the Mirror PowerVision adds the convenience of a monochrome mode.

The Mirror ViewPort's 15-inch full-page display was speedier than the now-discontinued RasterOps ClearVue/SD21 and was in the midrange in terms of speed compared with the other adapters. When displaying 8-bit color on a PowerBook 170, the platforms with the Aura ScuzzyView performed almost 40 percent faster than did those with

the Radius PowerView, the recommended SCSI video adapter in our December 1992 report. The Lapis PowerBase I, however, was noticeably faster than both the ScuzzyView and the PowerView on a PowerBook 170 in monochrome mode.

The Bottom Line

Choosing the right video adapter for your first-generation PowerBook or slotless compact Mac depends on your needs and how much you have to spend. The internal Mirror PowerVision was the best performer of the bunch for the PowerBook 140, 145, or 170, although it's expensive and limited to a 13-inch monitor. The Aura ScuzzyView costs less than the internal adapters and performs better than our previous favorite, the Radius PowerView. For those who have a PowerBook 100 or a compact Mac and want a big monochrome screen, the full-page Mirror ViewPort may be the answer.

— Katherine Barnes 

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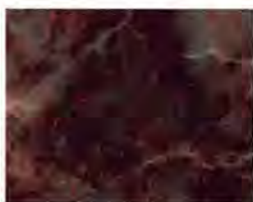
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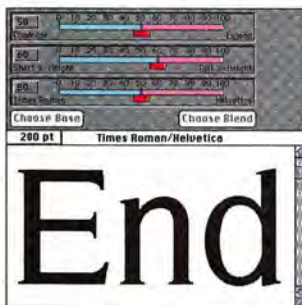
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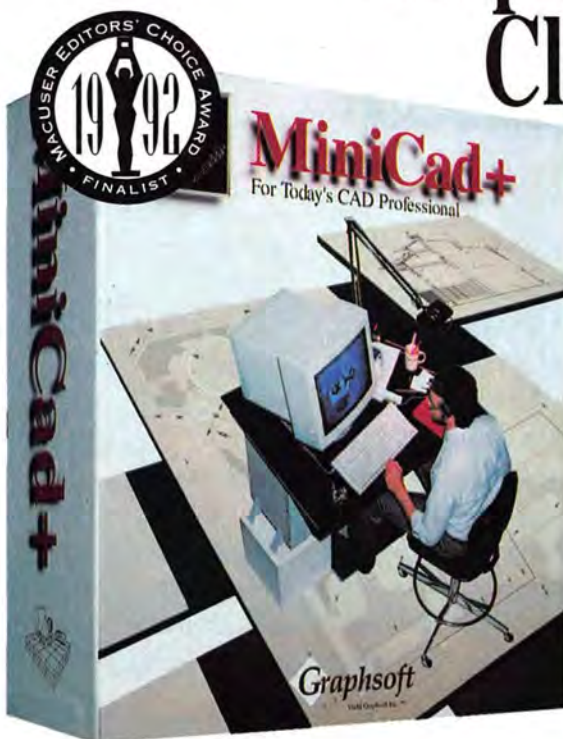
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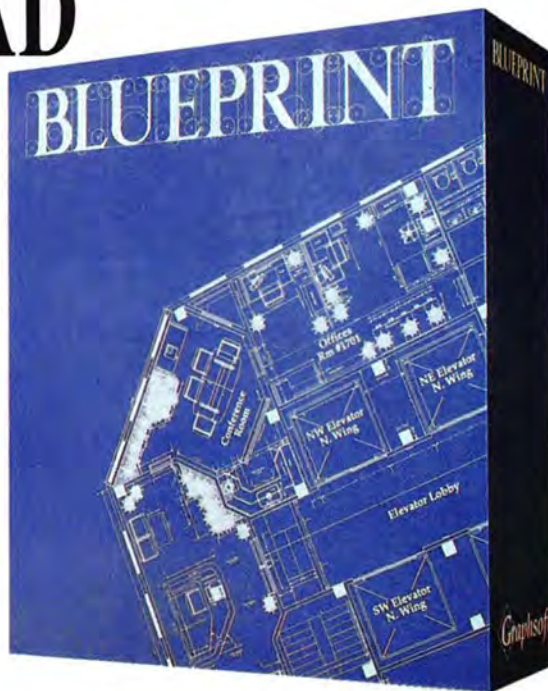
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By Pamela Pfiffner

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The Four-Color Trap



Desktop publishers haven't had to worry about using trapping to compensate for printing problems. That's changed: Trapping has come to the desktop.

By Kathleen Tinkel

If printing presses were as precise as Macs, you wouldn't need to understand how to perform fancy technical maneuvers such as *choking* or *spreading* artwork. You'd be able to spend your days designing pieces, applying colors with abandon, and still get perfect printed pages.

But computers present an idealized version of physical reality compared with the flawed hurly-burly of presses, papers, and press operators. The motley collection of techniques used to compensate for misalignment of adjacent color areas in printed work — nowadays encompassed by the umbrella term *trapping* — arose because presses are mechanical devices that deposit ink imperfectly on paper and other elastic materials. The resulting irregularities — such as glimpses of white paper or unintended color at the edges of objects (see Figure 1) — break the fragile illusion created by the four-color printing process, in which tiny clusters of dots are arranged to fool the eye into thinking it's looking at natural color.

The need for trapping arose from the offset-printing process, which simulates full, natural color by printing layers of the four process inks: cyan (C), magenta (M), yellow (Y), and black (K), known familiarly as CMYK inks. But until desktop publishing brought page design and creation to the desktop, designers, production artists, and others who created camera-ready art for printing rarely dealt with trapping. They certainly

did not build traps themselves, and they rarely even discussed them with their printers. Strippers — printing specialists who assemble the negatives for printing plates — took precautions with abutting colors as a necessary part of the process.

The same desktop-publishing technology that shifted responsibility for typesetting into the hands of designers and other users is now shifting responsibility for at least some aspects of printing production, including trapping, in the same direction. Although that's unlikely to make color specialists obsolete (as typesetters have virtually become), it does require that designers learn more about chokes, spreads, and other prepress issues.

Most color printing jobs of any complexity require trapping. If you're a desktop publisher, you have three choices: prepare mechanicals (complex pasteups with transparent overlays), and let a professional printer prepare traps traditionally (usually neither sensible nor cost-effective if the file is electronic to begin with); deliver computer files to a prepress service for trapping with digital equipment and techniques; or build traps in to your electronic files yourself.

To put you well on your way to becoming a master trapper, here's an overview of what trapping is, how to apply it in several key desktop-publishing programs, what new trapping products lie around the corner (such as IslandTrapper, from



Figure 1: Trapping compensates for visible flaws that arise from press misalignment, paper stretch, or other hazards of the printing process. When this happens, unintended slivers of color appear at the edges of objects.

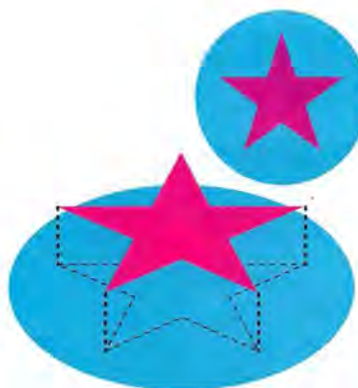


Figure 2: Overprinting — simply resting one color object on another — is the easiest way to avoid having to trap. Because four-color process inks are somewhat transparent, a third color forms where the two colors overlap.



Figure 3: To avoid the unexpected colors that may result from overprinting, you can knock out the background beneath an object. PostScript automatically creates knockouts unless you tell it to overprint.

Island Graphics, and TrapWise, from Aldus), and when you should leave trapping to the pros. Remember that trapping is a skill that takes time to master and that these rules are only guidelines. To learn the best approach for your projects, talk to your printer before you embark.

Trapping Terms

Desktop publishers' use of the term *trapping* is technically incorrect. Printers have long used the word to refer to the capacity of one ink to adhere to another in overprinting. To refer to techniques used to compensate for the shifting of paper on a press, they use the specific terms *chokes* (or *shrinks*) and *spreads* (which do involve some kind of overprinting and is how trapping may have become the catch-all term for these specialized techniques).

Regardless of whether trapping is done conventionally by a stripper at the print shop, on your desktop as you prepare the files, or by some high-tech electronic system, trapping techniques generally include the following:

Overprinting. As its name implies, overprinting means that you print one color of ink on top of another, relying on the inherent transparency of printing inks to produce a third color where both colors print (see Figure 2). Any software that permits you to create (or clone) an object or to apply a stroke or outline around it, position it precisely, assign a color to it, and designate some but not all objects to overprint can be used to build traps.

Knockouts. Publishers *knock out* an

object — produce a hole the object's shape and size in the objects or background behind it — to create reverses (things that take on the color of the paper itself). You can also use knockouts (often abbreviated as KOs) to trap objects of a second color in cases where overprinting is likely to produce undesirable colors.

PostScript produces knockouts automatically, which is why in virtually all desktop-publishing programs, you have to specify when you want one object to overprint another. But this feature of PostScript, which sees every object as opaque, makes it easy to produce a magenta star on a cyan background — draw the star and the background object, and your software will knock out a window and fill it with magenta (see Figure 3). (You will need to build a trap, however; more on this later.)

Spreads. If you simply allowed a yellow star to fill the knocked-out hole in a cyan background, imprecisions in the printing process might produce a small but visible rim of white. If you *spread*, or enlarge, the star slightly — generally by applying an overprinting outline or stroke to its circumference — the stroke will overlap the opening, and no white will show through, even if the paper shifts slightly during printing. (Your software must permit you to specify that the outline stroke overprints and the solid star does not.)

Because the yellow is lighter than the cyan boundary of the knockout, the darker color will be more obvious and will

define the star, even though the tiny trapped area will actually be a slightly different color (see Figure 4). If you choose your colors wisely, this rim of color will be barely noticeable.

Chokes. To print a cyan star over a yellow background, on the other hand, you need to *choke* (or reduce the diameter of) the knocked-out star. Since cyan is again the darker color that will define the form, you should not enlarge the star, which would distort it visually. Instead, you should effectively reduce the hole in the background by adding a stroke of the same lighter (yellow) color and set it (but not the star itself) to overprint, thus producing the trap (see Figure 5).

Design to avoid the need for trapping. Don't overlook another approach to trapping: Design your jobs to avoid the need for chokes or spreads in the first place, either by overprinting one process ink on another to create new colors or by making sure that adjacent objects share some percentage of one or more of the inks.

Create a new color. Overprinting a star of solid magenta (100-percent M) on a solid yellow (100-percent Y) background yields a red star where the colors overlap (see Figure 6). To make more-complex mixtures in which you use percentages of the CMYK inks or use more than two inks to form your colors, you should refer to labeled swatches of sample mixtures that are provided in books (available at any good graphic-arts-oriented art-supply store) on mixing process inks.



Figure 4: To trap a lighter-colored object, you spread it under the darker background. In PostScript applications, apply a stroke to, or slightly enlarge, the lighter object so that it overlaps the edges of the knocked-out hole.

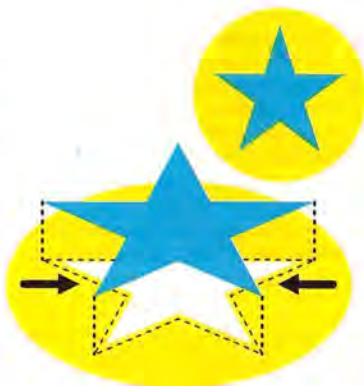


Figure 5: When trapping a darker object against a lighter object or background, you choke, or narrow, the knocked-out hole by applying a stroke to its interior edges. To enlarge the darker object would distort that object visually.

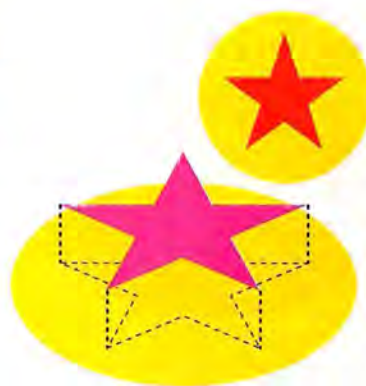


Figure 6: When possible, design to avoid trapping. In this example, I used overprinting to take advantage of the transparency of process inks, choosing colors that would create a red when combined.

One widely available reference is the PANTONE Process Color System Specifier; comparable products are also available for the TruMatch and Focoltone color-matching systems. The swatches are not foolproof (you probably won't be using the same inks or printing on the same paper used in the swatches) but can be relied on as guides.

This kind of overprinting can produce startling (often unpleasant) results when you're working with mixed-ink spot colors such as the numbered Pantone inks. Unlike process colors, these inks of mixed pigments are not designed to be combined. Effectively combining them *can* yield sophisticated, beautiful colors, but keep in mind that the results are more difficult to predict than with CMYK inks.

Use colors in common. Another technique for avoiding trapping is to make sure that the two abutting objects share at least one ink color in common (see Figure 7). This ensures that there will be no gap on at least one printing plate and thus no danger of a visible sliver of white, even if one or more of the plates shifts slightly. Of course, if the two objects are fairly dark and share only a light color (a screen tint of yellow, for example), this trick will be less effective than if they shared some deeper shade.

How to Trap on the Desktop

Most popular desktop-publishing applications include limited trapping capabilities. You can build traps manually in object-oriented programs such as

QuarkXPress, Aldus FreeHand, and Adobe Illustrator — and to a more limited extent, Aldus PageMaker — by cloning objects, adding strokes, or otherwise forcing objects to choke or spread. You cannot trap halftones or vignettes (graduated fills or blends) in these programs, nor does any of these programs allow you to create or modify chokes or spreads that are part of imported artwork (an EPS file from FreeHand placed in a QuarkXPress file, for example) — if the art was not trapped in the original application, it will not be trapped when the file is separated.

In Photoshop, on the other hand, you can trap CMYK blends (vignettes, degradés, graduated fills, or whatever else you call them) and export the resulting files to QuarkXPress or PageMaker for separating.

QuarkXPress 3.1, Aldus FreeHand 3.1, and Photoshop 2.0 have explicit trapping functions. The more you rely on such global functions, however, the more likely you are to get into trouble. You'll have more control — and learn better what works — if you construct traps yourself. FreeHand's automatic trapping is part of the program's printing function; the traps are not exported when you make an EPS file, so if you're not going to print the file directly from FreeHand, you must build traps manually, much as you would in Illustrator.

Halftones and vignettes. As a general rule, you should not trap halftones and other continuous-tone artwork such as pictures created in a painting program. They

don't have the solid colors and firm edges that generally cause problems that require trapping (or that, ironically, make them easy to trap). Photoshop lets you apply its global trapping function to such objects, but because it traps by creating a new combination color at every intersection, it's likely to make a mess. The best you can hope for is an image that looks slightly out of focus. If you want to trap the edges of a halftone by overprinting a half-point black rule, create the rule in your page-layout program.

If possible, use colors in common next to vignettes. If the abutting color is darker at every point, you can allow the vignette to spread, but if the background is close in value to tones in the gradient, you're likely to see an outline when you print. In such tricky cases, or if you need to trap one vignette to another, use Photoshop (after first converting the artwork to CMYK), because it can trap on a pixel-by-pixel basis.

When to spread, when to choke. You should almost always modify the lighter-colored object by spreading it into or choking it under the darker color so that the more prominent, darker form remains undistorted. If the foreground object is lighter, spread it; if the background is lighter, choke it.

Although you should generally spread light colors into darker, the overriding concern when you're working with type instead of objects is to preserve the original letter shapes and proportions. If you're using colors that have similar gray values



Figure 7: A design technique for skirting trapping is to make sure that the two objects or the object and the background have at least one process color in common. In this example, both objects share a percentage of yellow. The star knocks out the magenta in the background, but because the yellow printing plate has color everywhere, the white paper won't show through.

(colors that would look alike if converted to black-and-white, in other words), it's difficult — perhaps impossible — to create traps without doing violence to the type. Large, bold type can be trapped like any other object. If your letters have fine lines or small serifs, though, or if your type is small overall, it's preferable to rethink your design. Find a pair of colors with sufficient colors in common to avoid the need for trapping, and simply knock the type out of the background color or assign a different color or intensity to the type.

The approach is fairly clear when objects are obviously different in darkness, but it can be difficult to evaluate the darkness of some pairs of adjacent colors. Automated trapping routines use different algorithms to make this determination; some of them — especially in high-end systems such as Scitex — are closely guarded secrets, protected by patents.

Desktop programs tend to use simpler algorithms that work fine with most color pairs. Some things are constant — for example, yellow is always lighter than the other three process colors; cyan is lighter than magenta; and all three of these colors are lighter than black. Beyond that, the need to grapple with complex determinations of relative color value should signal either a need for a redesign or a good reason to pass the job along to a trapping professional.

How much to trap. This information must come from your print professional, who knows how accurate the presses are as well as the characteristics of the paper you have chosen. For sheetfed presses, it's likely that the printer will request an overlap of .003 inch (about .21 point). Most popular desktop-publishing programs center any line you've specified on the boundary of two objects, which means that you must double the width your printer

specifies (since half of the line will lie on the object you're trapping). QuarkXPress is an exception to this; it does the calculation for you, so you can just use the printer's specified value.

Proof, proof, and proof again. No matter what techniques you use to trap files on the desktop, you must proof carefully, even after you get to the point at which you believe you know what you're doing. The effects of trapping don't show on your monitor's display. You can see them in separated output, even from a black-and-white PostScript laser printer, especially if — for proofing purposes — you create an unusually wide trap of two or three points. (I usually duplicate the file and change the traps in the duplicate copy for proofing purposes. It's dangerous otherwise, because you might leave the giant traps when you send the file for separations, and the results would be worse than no trapping at all.) Because these are PostScript objects, you need a PostScript printer or a software PostScript RIP (raster-image processor) for proofing.

To detect the most-glaring problems, print separations to transparency material on your laser printer. A layered color proof — such as 3M's ColorKey or competitive products — that lets you examine each layer individually is useful for checking the film once it's been output. For any job that's too critical or costly for you to run more than once, it's a good idea to

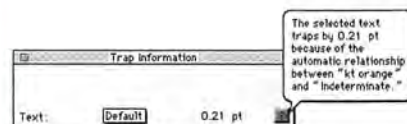
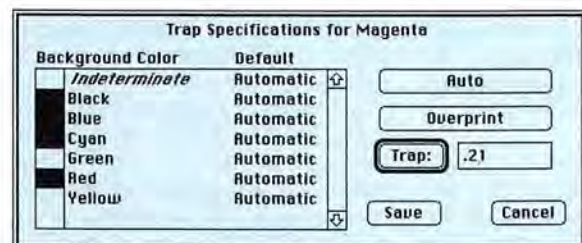
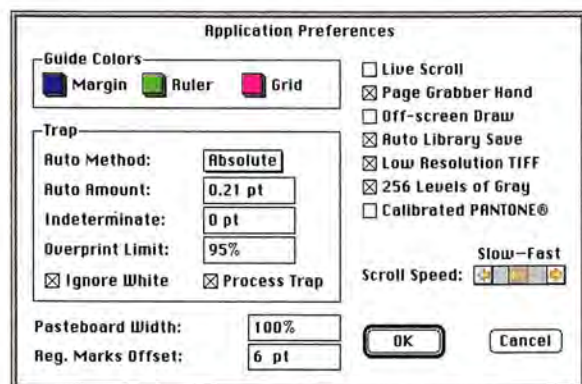


Figure 8: QuarkXPress 3.1's automatic trapping of PostScript elements works best for objects or type against a single background color. You can check your trapping in three dialog boxes: Application Preferences, for global trapping; Trap Specifications, for setting default traps for color pairs; and Trap Information, for checking trapping specifications for a given object.

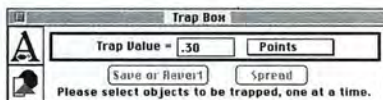


Figure 9: Although Aldus PageMaker does not have built-in trapping, The Utility Company's MouseTrap application lets you trap PageMaker pages that have been saved as EPS files. Because the program lets you only spread but not choke objects, its usefulness is limited.

spring for a proof from the printing press itself (called a press proof), especially until you're a seasoned trapper.

Trapping with Desktop Applications

With these general rules in mind, let's look at some specifics:

QuarkXPress. In version 3.1, QuarkXPress provides explicit support for automatically or manually trapping elements created within the program. The trapping

QuarkXPress provides is somewhat rudimentary but effective enough for trapping objects or type against a single background color. Things get a bit trickier when an object abuts two colors or a color photo (QuarkXPress labels such background colors "indeterminate" and may not trap the foreground object at all).

QuarkXPress traps are PostScript objects — usually clones of the elements you're trapping — rather than bit-mapped objects. If you apply a spread to a circle, the software will apply it to the entire diameter. QuarkXPress will trap type predictably as long as the entire text box is contained within the background color it's trapping to and as long as the text box (not necessarily the text itself) isn't overlapping any other colored object.

QuarkXPress gives you three dialog boxes that pertain to trapping specifications (see Figure 8):

- The Trap area in the Application Preferences dialog box. If you want to avoid being confused by the automation, use most of the default settings. The exception is the Auto Amount default, which comes preset to 0.144 point; I'd change it to 0.21. In the Trap Specifications dialog box, you can override any preferences settings, however.

- Trap Specifications, under Edit Trap on the Edit Colors menu. Here's where you specify how two colors trap to each other. If you know that you always want

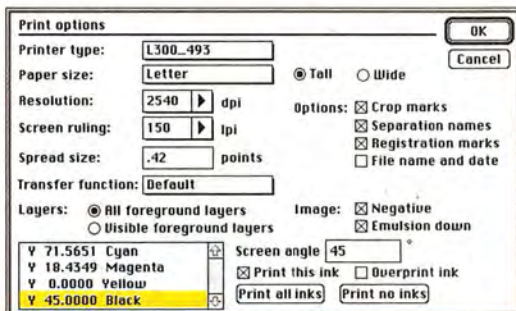
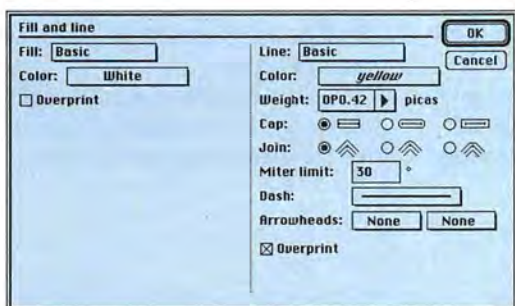


Figure 10: Aldus FreeHand's automatic-trapping function is convenient — you simply enter twice the trap width in the Spread Size box in Print Options (top) — but I recommend that you use its flexible drawing and layering tools (bottom) to construct traps.



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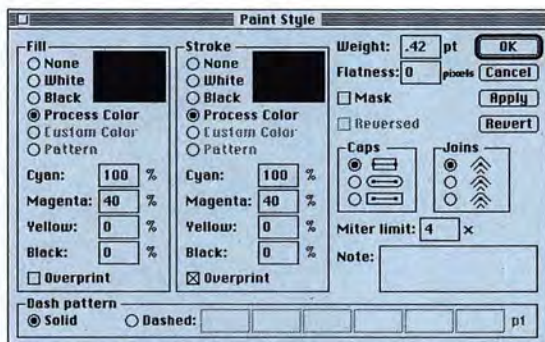


Figure 11: Adobe Illustrator lacks FreeHand's automatic trapping, but you can use its basic strokes and fills in combination with overprinting to choke or spread objects.

cyan to overprint magenta, for example, you can set it in this dialog box. (This is usually not a good move, by the way, because it's hard to keep track of these settings when you are also assigning trapping relationships by object.)

• The Trap Information palette, on the View menu. This dialog box reflects the settings in your Application Preferences and Trap Specifications dialog boxes. Use this palette to check the traps of any selected object.

Aldus PageMaker. PageMaker offers few tools for creating art or for trapping the objects you do create. If you're using objects made up of the rules, rectangles, or ellipses the program enables you to draw, however, you can duplicate the objects and use overprinting, fills, and line-weight adjustments to create simple traps. Files made with PageMaker 4.x and earlier versions have to be separated through PrePrint; PageMaker 5.0 (due to be introduced about the time this article is published) will separate color files directly.

MouseTrap, a \$150 program from The Utility Company, traps PageMaker pages saved as EPS files (which you do under PostScript Print Options in the Print dialog box). The program works by spreading PageMaker-drawn objects based on the PICT images (the images that show on your screen). Because it cannot choke and doesn't work on imported graphics, the program's usefulness is limited (see Figure 9). Rather than building trapping into future versions of PageMaker, Aldus is addressing the issue with TrapWise, a trapping-specific application (more on that later).

Aldus FreeHand. FreeHand has a couple of strengths as a trapping utility: It has powerful, flexible drawing tools that enable you to control trapping for parts of objects, and its layering function can help you keep track of what you're working on. (Its power, in fact, can lead you to

create illustrations so complex they're hard to output).

FreeHand offers automatic trapping (achieved by entering a value that's twice the required trap width in the Spread Size box in the Print Options dialog box), but I don't recommend it. You'll have more control if you bypass the semiuniversal Spread Size command (it doesn't work for radial or PostScript fills or in some other complex situations) and use overprinting in combination with control of fill and line/stroke on clones of the objects you need to trap (see Figure 10).

Most of the time, it makes sense to trap object by object in FreeHand: Clone the object you need to trap, select it, enter the width of the line if appropriate, and click on Overprint in the Fill and Line dialog box, which you access from the Attributes menu. (For type, click on Overprint in the Fill and Stroke dialog box under Effect on the Type menu or go to Type Specs on the Type menu.) You can also include Overprint in a color definition so anything assigned a particular color always overprints, but that's harder to keep track of than controlling each object directly.

For very complex files, you can use Paste Inside, FreeHand's version of the PostScript clipping-path command, to mask objects. You have to experiment and proof carefully. If my job were that complicated, I'd consider having a pro do the traps for me.

Adobe Illustrator. Although Illustrator has no built-in trapping function and doesn't offer the convenience of layering, you can overprint objects, strokes, and fills or use masking to create traps manually, much as you can in FreeHand (see Figure 11). As with FreeHand, you must double the desired line weight to obtain the effect of the correct trap width. Unless you place the art in QuarkXPress or PageMaker, the trapped file must be separated in Adobe Separator.

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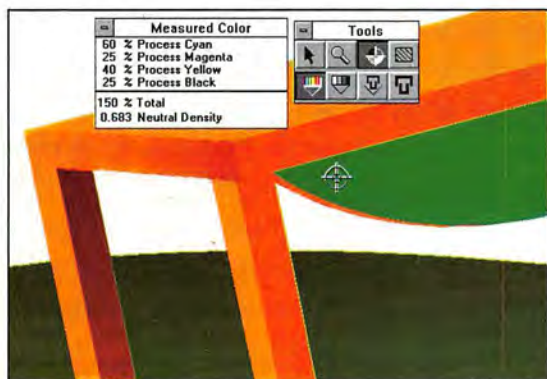


Figure 12: Aldus TrapWise's on-screen densitometer (shown here in its PC version) automatically measures color values to intelligently decide where to place a trap. Based on these color relationships, TrapWise spreads the lighter colors into the darker or chokes the darker colors into the lighter.



Figure 13: IslandTrapper, from Island Graphics, promises to offer continuous trapping of one color to another as it changes across boundaries. It works with EPS objects but can't trap vignettes or graduated fills.

Adobe Photoshop. Photoshop has an automatic-trapping function that can be applied to CMYK images. To use this function, you convert a copy of your file to CMYK (preserving the original) and select Trap from the Image menu. You'll be prompted for the width of the trap, which you can express in pixels (based on the resolution of the image on-screen — a 1-pixel trap at 72 dpi is equivalent to a 1-point trap), points, or millimeters. Remember, in the case of Photoshop, you should specify the actual trapping width required, not double that amount.

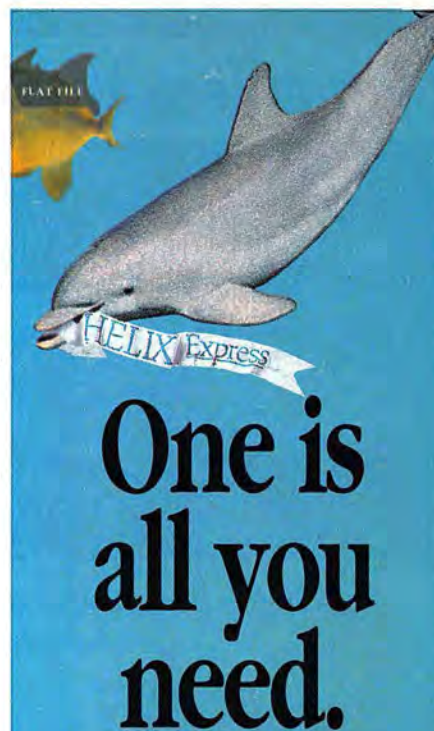
Trapping off the Desktop

Desktop applications do a decent job of trapping, but they don't come close to the precision offered by high-end equipment or by human expertise. The real question is, Should you, as page creator, be concerned with trapping in any case? In the past, designers didn't alter their artwork to avoid printing problems, and you're probably furthest from the press of anyone in the entire desktop-to-printing process. Besides, the need to grapple with technical issues — which include

trapping — can get in the way of the design process.

When trapping is simple and the appropriate technique for choking or spreading is obvious, you can do the trapping yourself fairly easily in QuarkXPress or FreeHand, by working a little harder in Illustrator, or — if the requirements are very simple — by using PageMaker. However, if the page is complex, if the cost of making a mistake is high, or if you simply don't want to be responsible for trapping, most of your options are unattractive. You can, for example, print the job on paper, build a mechanical, mark the color breaks, and let your printer use traditional camera techniques to trap the art. This may be cost-effective as far as trapping goes, but you lose the higher quality of going directly to film negatives and have to pay — in your own labor if not in cash — to produce the mechanical.

Alternatively, you can hand the disk containing your work over to a color-prepress house and have it do the trapping on a high-end workstation — assuming that you can locate a service that's willing to convert your file just for trapping. This



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Graphics Layer

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Auto Hyphenation

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FIND/REPLACE FEATURES:

Find All

Wild Cards

Font, Size, Style, Color Sensitive

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Yes Yes

Yes —
Yes —
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Yes Yes
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135,000 135,000
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1.4 Million 1.4 Million

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DESKTOP PUBLISHING

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costs less than it used to, but unless you're also having image editing or other work done to help justify the minimum charges, it still can easily run \$50 or \$100 on top of the output charges.

These circumstances make a couple of forthcoming programs aimed at print shops and service bureaus very interesting to desktop publishers: TrapWise (\$4,995 from Aldus, initially available for the PC, with a Macintosh version to follow) and IslandTrapper (\$2,195 from Island Graphics, available for the Mac) should make serious trapping tools available to small print shops and color-output services around the country and will bring reasonably priced trapping closer to the desktop. These programs and others such as Full Auto Frame for the Mac (less than \$10,000 from Scitex, due out during the first quarter of this year; a PC version is already available) are alike in working on desktop computers (instead of requiring dedicated workstations such as high-end systems from Scitex or Linotype-Hell). Both TrapWise and IslandTrapper accept EPS files from popular desktop-publishing applications, translate the files into proprietary formats for trapping, and create EPS files ready for separating and printing. Both TrapWise and IslandTrapper can choke or spread embedded EPS files as well as native objects in the file. And both programs offer automation but also allow users to intervene on several levels.

Based on the vendors' claims (neither program was available at press time), a few differences between TrapWise and IslandTrapper may make one of these more suitable than the other for a given job. For example, unlike IslandTrapper, TrapWise can trap one vignette to another. TrapWise traps by editing pixels, much as Photoshop does, but with more intelligence and power (see Figure 12). IslandTrapper works with objects but can conceivably do a better job of trapping than QuarkXPress, because it can break a boundary where it crosses from one background color to another and trap the object differently to adjacent objects of different colors (see Figure 13).

The real significance of these new products, though, is that professional trapping will be more accessible and affordable to desktop publishers, assuming that small print shops and service bureaus buy them. Judging from the early response, it seems likely that they will. In this way, trapping will move down the line from high-end

systems toward the print-production process, which is where it seems to belong logically.

Feeling Trapped?

In the end, there are good reasons to let your professional print shop control trapping for you. If you let a printer trap your file, you avoid arguments about which of you is really responsible for quality on the printing press (or worse yet, later — in the final product).

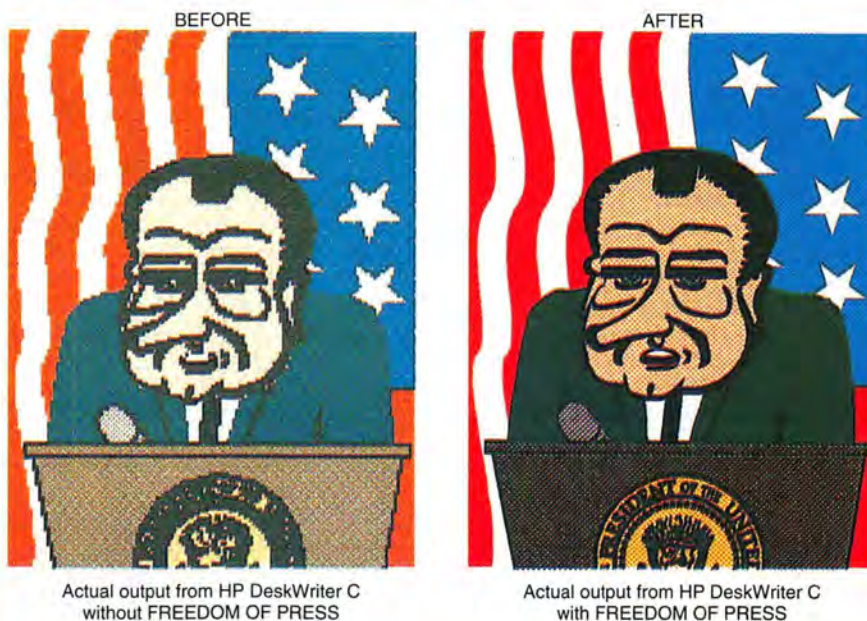
If, on the other hand, you assume responsibility for trapping and separating your artwork, you'll also probably have to accept responsibility for whatever emerges from the press. You should never consider taking that responsibility without generating prepress color proofs to check your traps and other aspects of the job. Digital proofs are not adequate in this case: Only an expensive press proof comes close to the final result.

Above all, trapping is meant to avert printing problems. Although you may not be able to envision every possible problem, your commercial printer should be able to, based on the characteristics of the particular press (web presses require more trapping than sheetfed presses do; older presses are likely to need more trapping than newer ones do); the paper being used (some types are more likely to stretch than others, and all stretch more with the grain than against it); environmental conditions (fluctuating humidity wreaks havoc with paper stability); and — on older presses, at least — the expertise of the press operator (a skilled printer with a good press may be able to butt objects without choking or spreading if you're willing to pay for that level of care).

The modern version of an old printers' adage says that if something needs fixing, it costs \$5 in the file, \$50 in film, \$500 on the plate, and \$5,000 on press. With this in mind, consult with your printer early in the design process, long before you have a completed file ready for output (this is good advice for all print jobs, not merely those that involve trapping). Any problems you iron out — or better yet, avoid — in the early stages of the job will save money down the road. ☐

Kathleen Tinkel is coeditor of *MacPrePress*, a weekly fax newsletter. Technical assistance for this article was provided by Kathryn McCafferty, who has worked for ten years as a color stripper — conventionally, and now on the Mac. She works for W. E. Andrews, in Bedford, Massachusetts.

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CIRCLE 91 ON READER SERVICE CARD.

The Art of Clipping

*Use PostScript clipping paths in drawing programs
to create special masking effects.*

By Janet Ashford

One of the most powerful features of a PostScript illustration program is its ability to use any closed shape as a clipping path or mask. A mask acts like a stencil over another image so that you see only the part of the underlying object that falls within the stencil's cutout areas. In PostScript these cutout areas are defined by clipping paths. Masks can be used to crop imported TIFF images or to add transparency effects. For instance, to make it appear as if a piece of glass is lying over an illustration, you can insert a lightened clone of the illustration into the shape of the piece of glass.

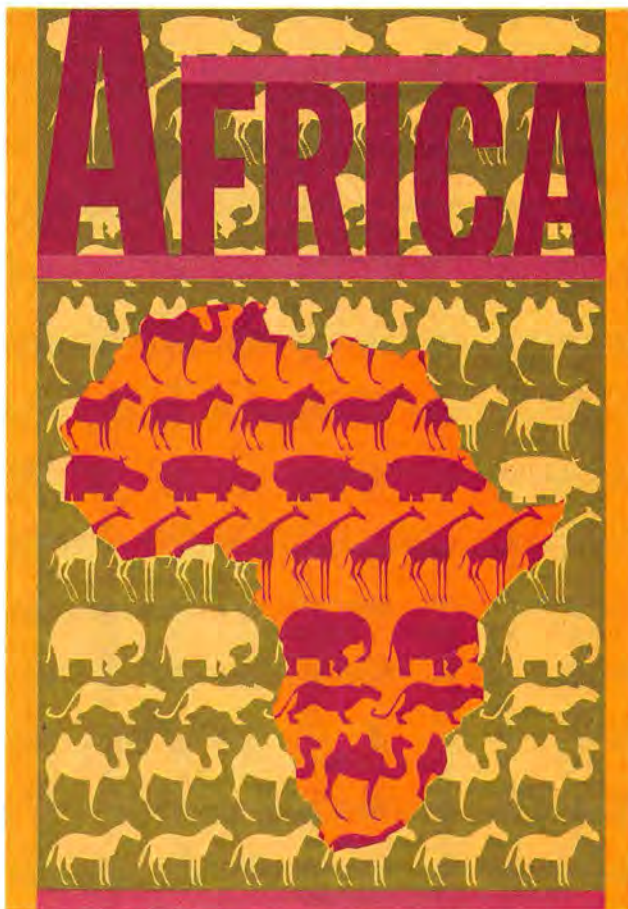
A clipping path can also be used to create a color change across a boundary, as shown in this poster of the wildlife of Africa. I used a path in the shape of the African continent to cut out a grid of red-colored animals. The clipped elements lie directly over an identical grid of beige-colored animals, so that

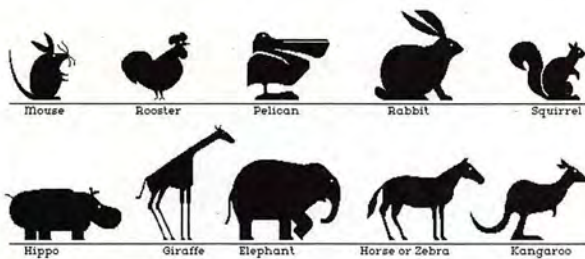
the outline of Africa is defined by the animals' changed color. (To further emphasize the shape, I altered the background color as well.) I used Aldus FreeHand's Paste Inside technique, but you can achieve the same effect with Adobe Illustrator by using the Mask option in the Paint Style dialog box.

Remember that clipping paths add to the complexity of your illustration and increase printing time. To avoid service-bureau overtime, make sure the path you use as a mask has as few points as possible (delete points if necessary) and consider increasing its flatness value to 3 or 4 (the default is 0). This will decrease the number of small line segments used to describe the curves in your path and will make your illustration print faster.

Janet Ashford is coauthor of *The Verbum Book of PostScript Illustration*.

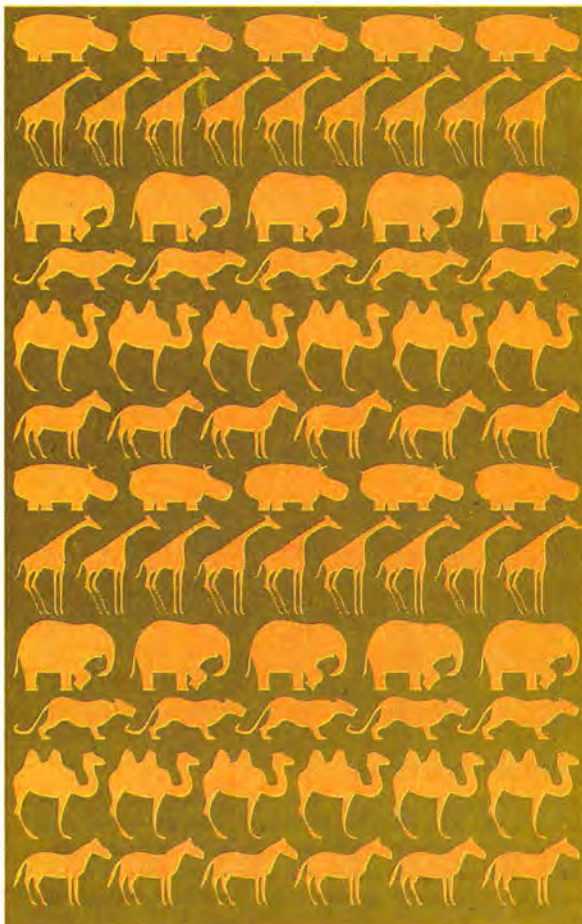
For a poster design I used the Paste Inside function of FreeHand 3.1 to insert a grid of red-colored animals into an outline in the shape of the African continent. The darker animals lie directly over an identical grid of lighter-colored animals. The sharp color change defines the continent's outline. Altering the background color further emphasizes the shape of the continent.





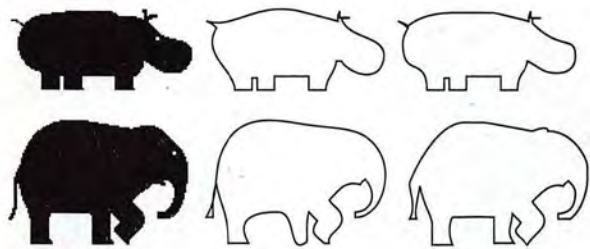
1 Using Clip Art

I began the project by opening a page of animal silhouettes from Miles Computing's Mac the Knife, a collection of clip art in MacPaint format. PostScript techniques can give new life to old software: The Mac the Knife collection dates back to 1984.



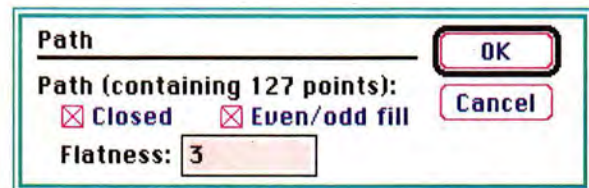
3 Creating a Grid of Animals

After tracing the hippo, giraffe, elephant, panther, camel, and zebra, I specified that each animal have a beige fill and no line. Then I duplicated and positioned them as six horizontal lines of animals. With FreeHand's alignment tools, I could lock each animal to the same baseline and space them evenly. I stacked and grouped the six lines of critters and then copied the group. I placed this grid of animals over a solid green rectangle.



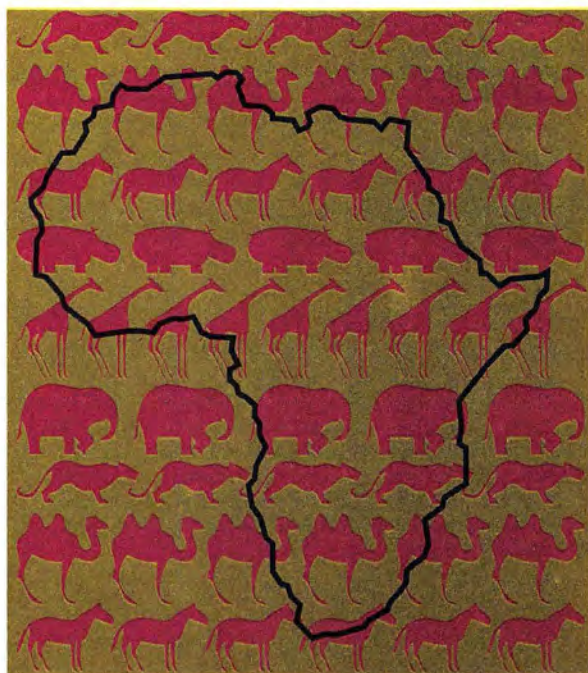
2 Tracing the Animals

I placed the MacPaint art in FreeHand and used the trace tool to automatically convert six of the animals to PostScript outlines. Double-clicking on the trace tool brings up a dialog box in which you can select or deselect a tight trace. I chose Tight because the result more closely follows the outlines of the MacPaint art. Using the hippo and the elephant as examples, this figure shows the original Mac the Knife art (left), a trace done with Tight deselected (middle), and a trace done with Tight selected (right).



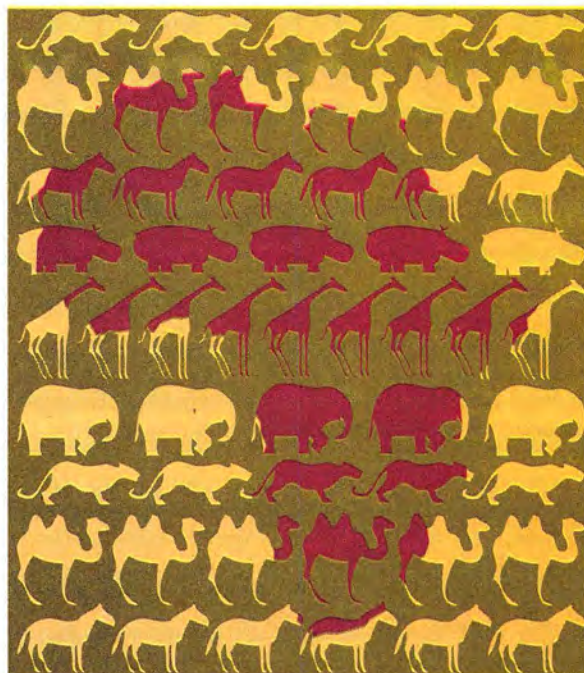
4 Reducing Complexity

To create the clipping path, I scanned a map of Africa and traced it. The original outline was complex, with 179 points. To simplify the path and reduce printing time, I deleted 52 redundant points, taking care to avoid significantly changing the shape of the outline. To further simplify the path, I called up the Element Info dialog box from the Element menu and increased the flatness value of the outline from 0 to 3.



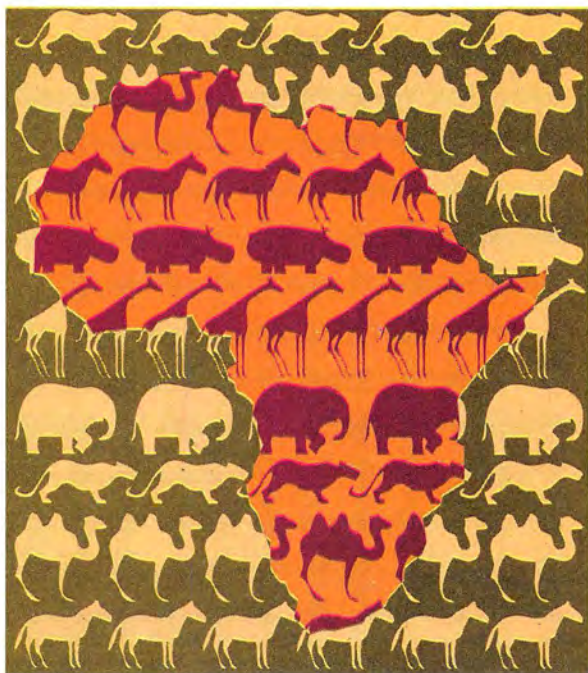
5 Positioning the Mask

FreeHand's Clone command (Command+=), on the Edit menu, duplicates an object and positions the copy on top of the original. I cloned the beige-animal grid and colored it red. Then I placed the Africa outline (shown in black) over the stacked grids.



6 Pasting Inside

I cut the red-animal grid (Command-X). After selecting the Africa outline and changing its line to None, I chose Paste Inside from the Edit menu to paste the red-animal grid into the Africa shape.



7 Adding a Background

Changing the fill from None to a shade of orange emphasized the shape of Africa. Adding type and borders completed the poster.



8 Playing with Type

Use clipping paths to create two-toned type too. Here I created red type, cloned it, and changed the clone's color to green. I then pasted the green type into an orange, triangle-shaped clipping path and placed all the elements on a brown background. The color change through the type forms a diagonal line.

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7.1 for all: Now that Apple is charging money for each copy of System 7.1, it almost looks as though multi-Mac sites are



required to buy *every user* either a \$99 Personal Upgrade Kit (to upgrade from System 6) or a \$34 System 7.1 Update Kit (to upgrade from System 7.0.x). Thankfully there's a more practical solution in the

form of the **System 7 MultiPack** (\$499), a CD-ROM that contains System 7.1 and specific documentation for administrators (plus the standard docs, of course). The MultiPack provides only a ten-user license, however. Call Apple at 800-769-2775 (or contact your Apple sales rep) if you need more.

Instant upgrades: Anyone with a site license for a software package knows what fun it is to upgrade everyone on the net when a new version arrives. Although a few third-party updating products are available (try TechWorks' GraceLan Update Manager or Pharos' Status*Mac 3.0), not that many software vendors supply network upgrading as part of the license. Kudos to Symantec, which now provides **free network installation**



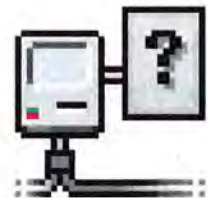
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By Stephan Somogyi



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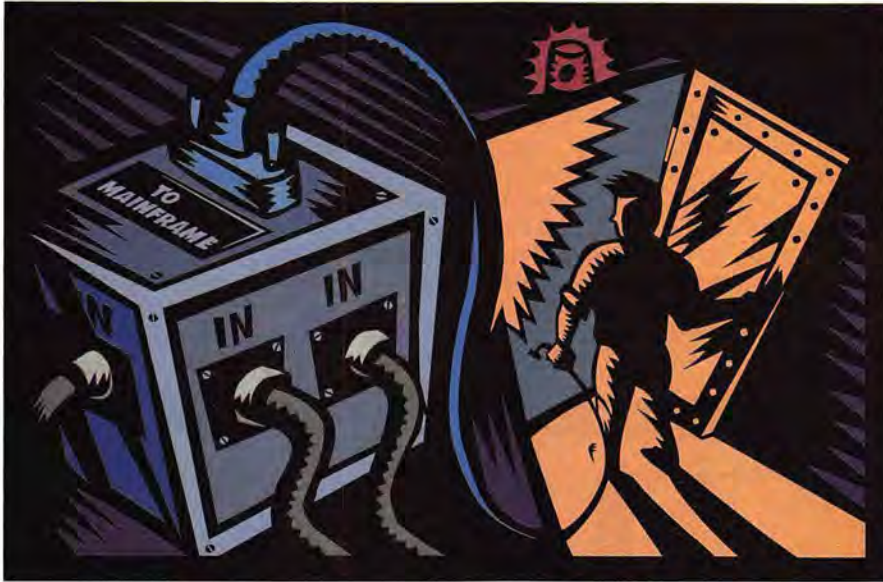
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CIRCLE 178 ON READER SERVICE CARD.

Gateways to Big Blue



With a gateway on your LAN, accessing an IBM mainframe from your Mac can be as easy as accessing a printer.

By Ernest H. Mariette

When enterprising Mac users first started connecting their Macs to IBM mainframes, they already had an advantage over PC users, who had to fiddle extensively to make sure their switch settings, software configurations, and cluster-controller reconfigurations were just right before even considering the inevitable hardware problems. Mac users could install a card and some software and connect to the cluster controller (a device for connecting a mainframe to dumb terminals) with a lot less hassle. But putting a coax or SDLC (Synchronous Data Link Control) card into every Mac on a LAN (local-area network) is an expensive proposition. Wouldn't it make more sense to set up one connection — a gateway to the mainframe, as it were — and let all the Macs on the network share it just as they would share a printer?

In fact, many gateway products on the market today make selecting an IBM SNA (Systems Network Architecture) gateway just about as easy as choosing a printer from a Mac on LocalTalk, Ethernet, or token-ring LANs. These products all perform essentially the same function — providing a portal through which LAN-connected machines can send and receive display-terminal data or APPC (Advanced Program-to-Program Communication) transactions to and from an SNA network. Vendors offering gateway products include Macintosh veterans Apple; Digital Communications Associates (DCA); and Avatar, which acquired gateway pioneer Tri-Data last year. These vendors were recently joined by PC vendors Attachmate,

Banyan, and Novell. Which gateway you should choose — and what platform it should run on — depends on what systems and network strategies you have in place and on what features you're looking for.

Gateways Your Way

If connecting Macs to your existing cluster controller no longer seems worthwhile (see the "Sticking with Your Controller" sidebar), you have four options for the type of gateway you use to replace the controller (see Figure 1):

- Software and an appropriate mainframe-connection card that let you use a Mac as a gateway from a Mac-only LAN (Apple's SNA•ps Gateway or Avatar's MacMainFrame).
- Software and an appropriate mainframe-connection card that let you use a Banyan VINES or Novell NetWare server as a gateway from a mixed LAN (Novell's NetWare for SAA or Banyan's VINES Communication Gateway for 3270).
- Software and an appropriate mainframe-connection card that let you use a PC on AppleTalk as a gateway from a mixed LAN (Attachmate's EXTRA! 3270 Gateway Option or DCA's MacIRMALAN).

• A stand-alone piece of hardware optimized for gateway tasks on Mac-only or mixed LANs (Avatar's Netway 2000).

Two years ago, the only gateway option available for Macs was Avatar's Netway 2000. With the variety of new products available, sorting out the options these days requires a thorough

evaluation of what you have and where you plan to be in the future. Any of the products discussed in this article can handle basic terminal-emulation needs. Where they differ is in the way they provide that service and in the breadth of support they offer for IBM services.

The Mac-centric Approach

Although the current Mac-based gateways are limited to connecting Mac-only LANs to mainframes (that is, they don't support DOS or Windows clients), they have one major advantage over their PC-based competitors: They can be set up very quickly with standard NuBus machines (often dedicated AppleShare file servers are used so that another machine

doesn't have to be sacrificed to gateway chores). Installation of the cards and software offers the simplicity you'd expect from a Mac approach — in sharp contrast to the difficulty of typically problem-plagued installation on DOS-based machines. In one test case, we spent only 20 minutes installing an Avatar gateway on a Mac but required more than three hours to install comparable gateway software on a PC and to figure out what switch settings to use.

Two companies, Apple and Avatar, are in the Macintosh-based SNA-gateway business. Both firms provide NuBus cards that allow Macs to connect to SNA networks and distribute terminal sessions; Apple's products also distribute APPC

transactions. However, the two companies approach gateway design differently, and this is apparent in both their hardware and their software.

Avatar's hardware design provides significant performance advantages over Apple's, although Apple's design provides easier updates. The three Apple NuBus cards (the Coax/Twinax, the Token Ring 4/16 NB, and the Serial NB) use a Motorola 68000 chip running Apple's Real-time Operating System Environment (A/ROSE). The advantage of this design is that the gateway software is downloaded to the coprocessor rather than burned into ROM, so it's easy to update. It also means that the gateway logic runs independently of the Macintosh's built-in

Figure 1: Mac-to-SNA Gateways Don't Always Run on Macs

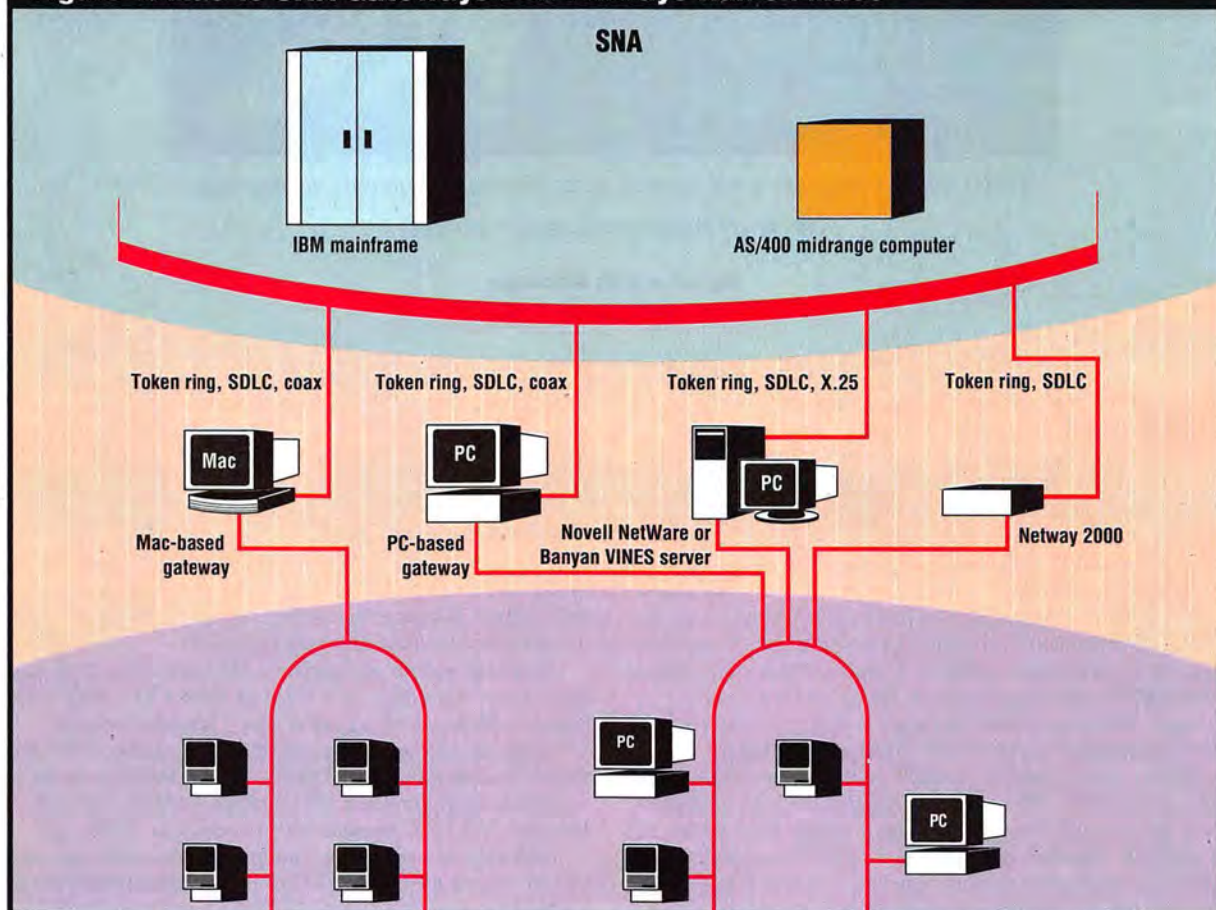


Figure 1: Connecting networked Macs to IBM mainframes (or IBM AS/400 midrange computers, which Apple's SNA-ps Gateway is expected to support as of May 1993) may require a non-Mac gateway — in fact, the Mac is only one of four possible gateway platforms: a Mac with NuBus slots, a PC on AppleTalk, a NetWare or Banyan PC server, and the gateway-in-a-box Netway 2000. All the gateways require both hardware — generally SDLC, token-ring, or coax cards — and software to perform the task of distributing mainframe sessions to Macs (and, in some cases, PCs) across a LAN.

processor. However, as the 68000 chip ages, its performance is starting to suffer, compared with that of the chips for Avatar's coax, token-ring, and SDLC cards, which are custom-designed to handle gateway tasks.

On the software end, Apple's products offer more conveniences for the network administrator. For example, the Apple SNA•ps Gateway's links with the mainframe can be started and stopped at will (also possible from remote applications), whereas Avatar's gateway software automatically loads whenever the gateway machine is started, with no way — other than turning off the machine — to start or stop the gateway. Changing an Avatar configuration setting requires a subsequent reboot; with the SNA•ps, multiple settings can be maintained and downloaded to the gateway card without a reboot. This SNA•ps capability can be particularly useful if the gateway is to be used to connect your networked Macs to more than one SNA network through a modem link.

One of the SNA•ps' most useful features is its ability to allow users to concurrently connect to multiple terminal sessions on other gateways connected to other hosts. (In this article, host means an IBM mainframe host, although SNA•ps gateways will soon allow Macs to connect to the midrange IBM AS/400 as well). The number of concurrent sessions is limited only by the available memory on the client machine. With Avatar's MacMainFrame, you're limited to connecting to one host at a time and the maximum number of concurrent sessions is 64.

Another gateway feature worth mentioning is support for APPC transactions. Apple is the only Macintosh gateway vendor that supports such transactions — an important consideration for transaction-oriented organizations such as banks that need peer-to-peer communication between a mainframe and machines on a LAN. Apple also has plans to support APPN (Advanced Peer-to-Peer Networking), the protocol for a dynamic data link that manages the directory and routing for a network node.

In the area of APIs (application-programming interfaces), however, Avatar's product is more flexible than Apple's. Both Avatar and Apple have created their own API tools for connecting to their gateway products, but Avatar's drivers allow MacMainFrame software to work with gateways from other vendors (see Figure 2). For example, MacMainFrame

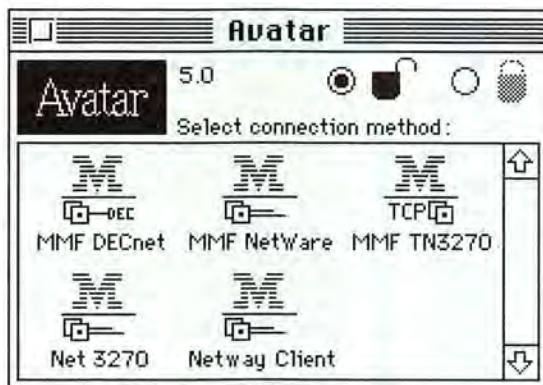


Figure 2: With Avatar's MacMainFrame gateway software, you're not limited to Avatar gateway hardware — you can select from gateways such as TCP/IP and Novell's NetWare, but your connection is limited to one host at a time, unlike with gateway software from Apple, Attachmate, DCA, and Novell.

software can be used with SNA•ps and Digital's PATHWORKS gateways, TCP/IP (TN3270) gateways, and gateways from Novell and Attachmate, along with Avatar's Netway 2000 and MacMainFrame offerings. This flexibility gives Avatar's software a significant competitive advantage, although support for DCA cards is conspicuously lacking.

Novell and Banyan Gateways

What can you do to provide SNA services if you have a NetWare, Banyan, or AppleShare server on your network? These machines already provide file and print services, so why not IBM connectivity? Sure, network bandwidth is a concern when you're having the same server act as a file and print server and as a gateway — you'll probably want to use token-ring or Ethernet connections — but adding gateway capabilities is a great way to get more use out of dedicated server hardware.

Novell's NetWare for SAA. Although many networking types still perceive

Novell LANs as Mac-unfriendly, Novell does offer file services (through the NetWare Loadable Module, or NLM, for Macintosh) as well as gateway services to Macs connected to a Novell NetWare server. Novell's SNA-gateway software, NetWare for SAA, is bundled with the AppleTalk-protocol stack, so Macintosh users who are concerned only about mainframe gateway services (and not about NetWare file services) can attach to NetWare servers without installing NLM for Macintosh.

You can connect a Mac network to a Novell NetWare server through Ethernet or token-ring cabling, but there's no support for a direct LocalTalk connection — you need to use a router to connect any LocalTalk portions of your network to one of the other two cabling types. The Novell NetWare server's connection to an SNA network involves one of three options: an SDLC card, from Microdyne; a token-ring card, from IBM; or a QLLC/X.25 card, from Newport. The Novell gateway uses high-speed X.25 cards rather

Sticking with Your Controller

If you've got a lot of 3270-type (dumb) terminals connected to your mainframe and you're not ready to replace them *all* with Macs, you may want to wait to replace the cluster controller. Sure, the controller's a dinosaur compared with the gateways discussed in this article — it's large and cumbersome to configure — but you can use it to connect Macs, PCs, and dumb terminals to a mainframe simultaneously.

With an appropriate NuBus card, you can attach a Mac to the cluster controller through the same coax cable designed to connect to a 3270 terminal. Avatar was the first vendor to develop a coax-card-and-software combination that allows a Macintosh to share sessions with other Macs on an AppleTalk network. This type of gateway is called a coax gateway. DCA and Apple also have coax gateway products.

If your Macs are on a token-ring network, you may not need a coax card for each Mac. Some cluster controllers have token-ring adapters installed, which allow them to act as pass-through gateways to SNA networks. Token-ring gateways can handle more simultaneous connections than can coax gateways, because they're not limited by the number of BNC connectors on the cluster controller.

than coax cards, because its server needs a high-transmission conduit to allow many concurrent sessions.

NetWare for SAA supports more concurrent sessions than any other product in this roundup — with the exception of Apple's SNA•ps, which supports as many as 506 sessions (as many as 26 per client) and lets clients connect to one or two hosts. Because NetWare for SAA has separate selection dialog boxes for choosing the gateway and the host, a user can connect to different gateways and different hosts simultaneously — unlike with the Netway 2000's Chooser-based method, which lets a user select only one host at a time. Although NetWare for SAA doesn't currently support the sending and receiving of APPC transactions, Novell plans to add APPC capability to this product in the future.

NetWare for SAA supports Novell network-management capabilities, including NetView alerts. For example, an administrator can start or stop the server and load or unload NLMs from the console. NetWare for SAA also includes support for the midrange IBM AS/400, although currently not with Mac clients. Novell plans to fully support NetWare for SAA in its upcoming version 4.0 of the NetWare operating system.

NetWare for SAA is intended to be an add-on product for sites with installed Novell NetWare servers. You probably wouldn't want to go through all the time and expense of installing NetWare just to add an SNA gateway to a Mac network. Still, the ability to handle Mac clients makes NetWare for SAA a good alternative for managers faced with the task of supporting mixed Mac-and-PC environments. If you have NetWare or plan to install it, the NetWare for SAA alternative is a good choice. Be aware, however, that currently Novell's product doesn't support Apple's DAL (Data Access Language) connections, which means it can't use Apple's main strategy for accessing databases on host systems.

Banyan's VINES Communication Gateway for 3270. Banyan has taken a different approach from Novell in providing gateway services to users of its file servers: getting outside help. Banyan's gateway product, VINES Communication Gateway for 3270, is basically DCA's MacIRMALAN installed on a Banyan server. By working with DCA, Banyan has spared third-party software developers the task of rewriting software to work

Some Mainframe Jargon

If SNA or SDLC sound to you as if they might have been revolutionary organizations in the '60s, you're going to need a few definitions to get through this article:

APPC (Advanced Program-to-Program Communication)

An architecture devised by IBM to allow computers to communicate on a network as peers rather than in the master-slave relationship of mainframes to dumb terminals.

DAL (Data Access Language)

A system extension from Apple that allows applications to communicate with IBM's SQL/DS and DB2 and with other mainframe SQL databases such as ORACLE, Ingres, Sybase, and RDB. Formerly called CL/1. (DAL software must also be running on the host.)

NetView alert

A capability of IBM networks that allows querying of devices on the network from a NetView console.

NetView console

A terminal on an IBM network that controls network resources.

SDLC (Synchronous Data Link Control)

IBM's protocol for connecting modems to mainframes over telephone links.

SNA (Systems Network Architecture)

IBM's grand plan for connecting mainframes, midrange computers, and microcomputers in a wide-area network.

with its gateway — and spared sites that are equipped with Banyan servers the need to dedicate a separate PC as a gateway platform.

With DOS as Your Gateway

If you want a cost-effective gateway for a small, mixed network of Macs and PCs and you don't have a Novell NetWare or Banyan VINES server, you still have a choice of DOS-based gateway products. DCA and Attachmate have extended the capabilities of their gateway products, MacIRMALAN and EXTRA! 3270 Gateway Option, respectively, to include support for Macintosh clients. Each product solves the problem of connecting the gateway PC to an AppleTalk network by using the appropriate card (Ethernet, token ring, or LocalTalk). The gateway PC is connected to an SNA network by means of an SDLC, coax, or token-ring card.

In establishing how to make its products work with Macintosh applications, Attachmate chose a more flexible approach than DCA's by licensing technology from Apple. Because it uses SNA•ps drivers from Apple, Attachmate gateways can work with third-party mainframe-communication products such as DAL, Mitem's MitemView, and Connectivité's Both without modification. In contrast, DCA gateways work only with their own API, but all the major third-party software developers support it, because DCA

is such a dominant player in the market.

Attachmate's gateway-software architecture is also more versatile than DCA's in its load-balancing and fault-tolerance scheme. Attachmate gateways can work cooperatively with one another to distribute either pooled or assigned logical unit (LU) names. All Attachmate gateways are identified to the network with the same name, so users see only one gateway, but administrators are still able to identify specific gateways for network-management functions and NetView alerts. The workstation software seeks the first available gateway and automatically balances the network load.

In terms of ease of use, however, DCA's gateway administration wins over Attachmate's. A DCA gateway's administration is handled from a monitoring program that can be run on any machine on a LAN — including a Mac, with the help of a network utility. By contrast, Attachmate requires that gateway administration be handled on the PC where the gateway software is installed — an inconvenient method on a widely dispersed network.

DCA's MacIRMALAN also provides a unique file-transfer feature to help Mac users send files to DOS and mainframe systems: built-in support for DataViz's MacLinkPlus/Translators. This capability allows users to easily convert file formats before sending files or after receiving them.

Table 1: Which Gateway Is Your Best Way to a Mainframe?

	Apple SNA•ps Gateway	Attachmate EXTRA! 3270 Gateway Option	Avatar MacMainFrame	Avatar Netway 2000
Gateway-software price (from Mac LAN)	\$1,219 – \$3,649 for 8 – 128 sessions	\$50, plus \$425 for EXTRA! Extended for DOS (required)	included with gateway hardware	included with gateway hardware
Client-software price	\$105 per machine	\$425 per machine	included with gateway hardware	included with gateway hardware
Hardware price (if from same vendor)	token-ring card, \$909; SDLC card, \$1,019; coax/twinax card, \$1,019	SDLC card, \$270; coax card, \$570	SDLC or token-ring card, \$2,495 – \$6,495, depending on number of sessions; coax, \$2,495 for 5 sessions	\$6,995 – \$13,995 for 32 – 128 sessions
Pros	Only product to support APPC. Multiple sessions on different hosts. Gateway can be started by application program.	Mac and DOS clients. Compatible with Apple's SNA•ps API. Automatic load balancing.	Simple to install. Excellent postsales support. Hardware optimized for gateway tasks. Software runs with other gateway hardware.	Gateway and router in one box. Mac and DOS/Windows clients. Mac-based administration.
Cons	Mac-only product. Weak product support. No 3287-printer support. 68000 chip limits performance.	No 3287-printer support. Requires a DOS machine.	Mac-only product. Only one host at a time.	One host at a time. Not cost-effective for a small number of users.
Gateway platform	Mac with NuBus slots	IBM PC or compatible	Mac with NuBus slots	Netway 2000 (administered from any Mac on a network)
Mainframe connection	SDLC, token ring, coax	SDLC, token ring, coax	SDLC, token ring, coax	SDLC, token ring
3270-terminal types supported	types 2 to 5	types 2 to 5, DOS client, Windows client	types 2 to 5, APA graphics, TN3270	types 2 to 5, DOS client, Windows client, APA graphics, TN3270
Printer support	none	none	3287 emulation	3287 emulation
File-transfer methods	IND\$FILE	IND\$FILE, PS/CICS, OV/MVS import and export	IND\$FILE, proprietary Avatar HFT	IND\$FILE, proprietary Avatar HFT
Support policy	90 days' free support; unlimited call support, \$1,195 per year; per-question contracts available	free toll-free phone support	free toll-free phone support or paid premium support	free toll-free phone support or paid premium support
Company	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 800-776-2333 408-996-1010	Attachmate Corp. 3617 131st Ave. S.E. Bellevue, WA 98006 800-426-6283 206-644-4010	Avatar Corp. 65 South St. Hopkinton, MA 01748 800-282-3270 508-435-3000	Avatar Corp. 65 South St. Hopkinton, MA 01748 800-282-3270 508-435-3000

DCA's MacIRMALAN doesn't, however, support NetView alerts or session logging as Attachmate's EXTRA! 3270 Gateway Option does. Whereas EXTRA! provides an event log (in a text file) for keeping track of NetView events and a record of connections made to the gateway, MacIRMALAN provides only a trace facility — the trace is in binary

format — to keep track of any errors that are caused by the gateway.

In making a buying decision, be aware that DCA takes a more friendly approach than most other vendors do in determining the number of concurrent users that are possible with its gateway: You pay according to the number of users rather than according to the number of sessions

(a session being a single connection with a mainframe).

For example, if you pay for an 8-user DCA gateway that can access as many as 5 sessions per user, for a total of 40 possible sessions, you get 40 sessions for an 8-user license. The gateway is capable of supporting a maximum of 128 sessions, but the actual number of sessions that are

Table 1: Which Gateway Is Your Best Way to a Mainframe? continued

	Banyan VINES Communication Gateway for 3270	DCA MacIRMALAN	Novell NetWare for SAA
Gateway-software price (from Mac LAN)	\$3,995	\$1,495 – \$8,090 for 8 – 128 users	\$4,995 plus extra for Mac users (\$1,995 – \$14,995 for 16 – 254 sessions)
Client-software price	\$1,495 – \$7,495 for 8 – 128 users	\$425 per machine	\$195 per machine
Hardware price (if from same vendor)	SDLC card, \$995; token-ring card, \$695	SDLC card, \$995; token-ring card, \$695 – \$995; coax card, \$695	SDLC card, \$270
Pros	Mac and DOS/Windows clients. User-based pricing. Uses client's preexisting Banyan VINES server.	Mac and DOS/Windows clients. User-based pricing. Runs on an 8088-based PC; Mac-based- administration option.	Mac and DOS/Windows clients. Large number of sessions. Availability of X.25 connections. Uses client's preexisting Novell NetWare server.
Cons	Requires a Banyan VINES server. No support for NetView alerts.	Requires a DOS machine. No support for NetView alerts.	Requires Novell NetWare. No DAL support. No direct LocalTalk support. Expensive tech support.
Gateway platform	IBM PC 286 or compatible running VINES	IBM PC or compatible	IBM PC 386 running NetWare
Mainframe connection	SDLC, token ring	SDLC, token ring, coax	SDLC, token ring, X.25
3270-terminal types supported	types 2 to 5, DOS client, Windows client, APA graphics	types 2 to 5, DOS client, Windows client, APA graphics	types 2 to 5
Printer support	3287 emulation (limited to 5 sessions)	3287 emulation (limited to 5 sessions)	3287 support on the server
File-transfer methods	IND\$FILE, DCA, FT/Express	IND\$FILE, DCA, FT/Express	IND\$FILE, OV/MVS import and export
Support policy	support provided through Banyan authorized resellers	free basic-level phone support or higher-level paid support	\$150 per incident or \$15,000 for 2 years domestically, \$250 or \$25,000 internationally
Company	Banyan Systems, Inc. 124 Flanders Rd. Westboro, MA 01581 800-828-2404 508-898-1000	Digital Communication Associates (DCA) 1000 Alderman Dr. Alpharetta, GA 30202 404-442-4000	Novell, Inc. 122 E. 1700 South Provo, UT 84606 800-453-1267 801-429-7000

possible depends on the number of users you pay for.

Overall, the principal advantage of Attachmate's EXTRA! 3270 Gateway Option is its wide acceptance in the PC market. The ability to add Macintosh clients that are based on Apple's 3270 API set makes Attachmate's product attractive for managers who are working with mixed computing environments. However, the ease of gateway administration with DCA's MacIRMALAN makes it

well worth considering if your mixed network is more Mac-centric and you don't require support for NetView alerts.

Netway: Gateway in a Box

If Apple and IBM had decided to cooperate a few years back, Avatar's (formerly Tri-Data Systems') Netway 2000 might never have been. All IBM had to do was provide an AppleTalk-adaptor option to its controllers and write a bit of software, and the Netway 2000's niche

would have been filled. As it is, the Netway 2000 has been very successful in providing inexpensive mainframe connections when there are many Mac users.

The SPARC-based Netway 2000 is a lot like an IBM cluster controller that is enhanced with support for AppleTalk. On the mainframe end, the Netway 2000 can support as many as six hosts, four through RS-232 ports and two through token-ring adapters. For connecting to LANs, the Netway 2000 comes with two LocalTalk

connectors and two slots that can support either Ethernet or token-ring adapters. If you're connecting to more than one of these LAN types, you'll appreciate this bonus: The Netway 2000 also provides routing services among AppleTalk, Novell IPX, and TCP/IP networks.

The Netway 2000 is easy to administer. It's the only gateway product besides DCA's that provides both mixed-network gateway services and Mac-based administration (you can administer the Netway 2000 from any Mac on a network). Also, once you've downloaded the configuration parameters to the Netway 2000 from the administration machine, the Netway 2000 takes care of itself.

Client software consisting of a Chooser

The Netway 2000 makes sense when many people need to connect to an SNA network; for smaller groups, Macs and PCs with gateway software and cards are cheaper.

extension and terminal-emulation software is all you need to make it possible for any machine on the network to connect to the Netway 2000 gateway. Avatar provides MacMainFrame for terminal emulation and sells a tool kit called FrontCard for building HyperCard front ends, but you can also use products such as MitemView, Both, and SimWare's SimMac for terminal emulation and front-end building.

The Netway 2000 does have some limitations. Although a high-performance SPARC chip optimizes its performance, the Netway 2000 doesn't accommodate simultaneous connection to multiple hosts, because host sessions are selected from the Mac Chooser. Users can connect to multiple sessions on the same host system, but if you want to connect to multiple *different* hosts at the same time, you're out of luck. Newer products such as Apple's SNAps and DCA's MacIRMALAN have bypassed the Chooser's one-host limitation by implementing other methods for selecting hosts and sessions visible on the network.

A less important limitation is the disparity between the Mac and Windows


versions of the terminal-emulation software. Although the Netway 2000 supports Windows clients, Avatar's terminal-emulation software for Windows does not look or feel the same as the company's terminal-emulation software for the Mac. Avatar plans to merge and unify these products over time for more consistency.

The Netway 2000 is an excellent gateway product for situations in which many people (16 or more) need to connect to an SNA network. For smaller groups, Macs and PCs equipped with appropriate software and gateway cards can provide more cost-effective ways to get the job done.

The Bottom Line

Information managers who want to add Macs to their SNA environment now have a variety of cost-effective options for doing so easily. What the right approach for any individual company is depends partly on product features (see Table 1) but also, in large part, on what system the company has in place today. If your site is Mac-only, you need to weigh Apple's SNAps products, with their wealth of software-administration features, against Avatar's MacMainFrame software and higher-performance cards. Mixed environments have many choices — if Attachmate gateways are already there, you may well want to use them to attach Mac clients. If your company has Novell or Banyan servers, then the gateways from these vendors should be on your evaluation list.

If the choice for your situation isn't clear-cut, we recommend that you start by looking at the product line from Avatar. Although all the companies discussed here offer excellent products and are eager to assist in problem solving, Avatar has been in the Mac-only mainframe-connectivity market longer than anyone else. It has a very helpful technical staff and always seems to find solutions.

Of course, before installing any gateway, you should institute a thorough test program to identify feature lacks or incompatibilities that may prevent successful integration. There's no substitute for actually installing a gateway in your environment — so be sure to test your gateway before you try to send all the Mac users on your network through it. 

Ernest H. Mariette is principal consultant for Mariette Systems International, which provides consulting services to Fortune 1000 companies. He is the author of MacPROFF, a HyperCard-based front end for PROFS and OfficeVision VM.

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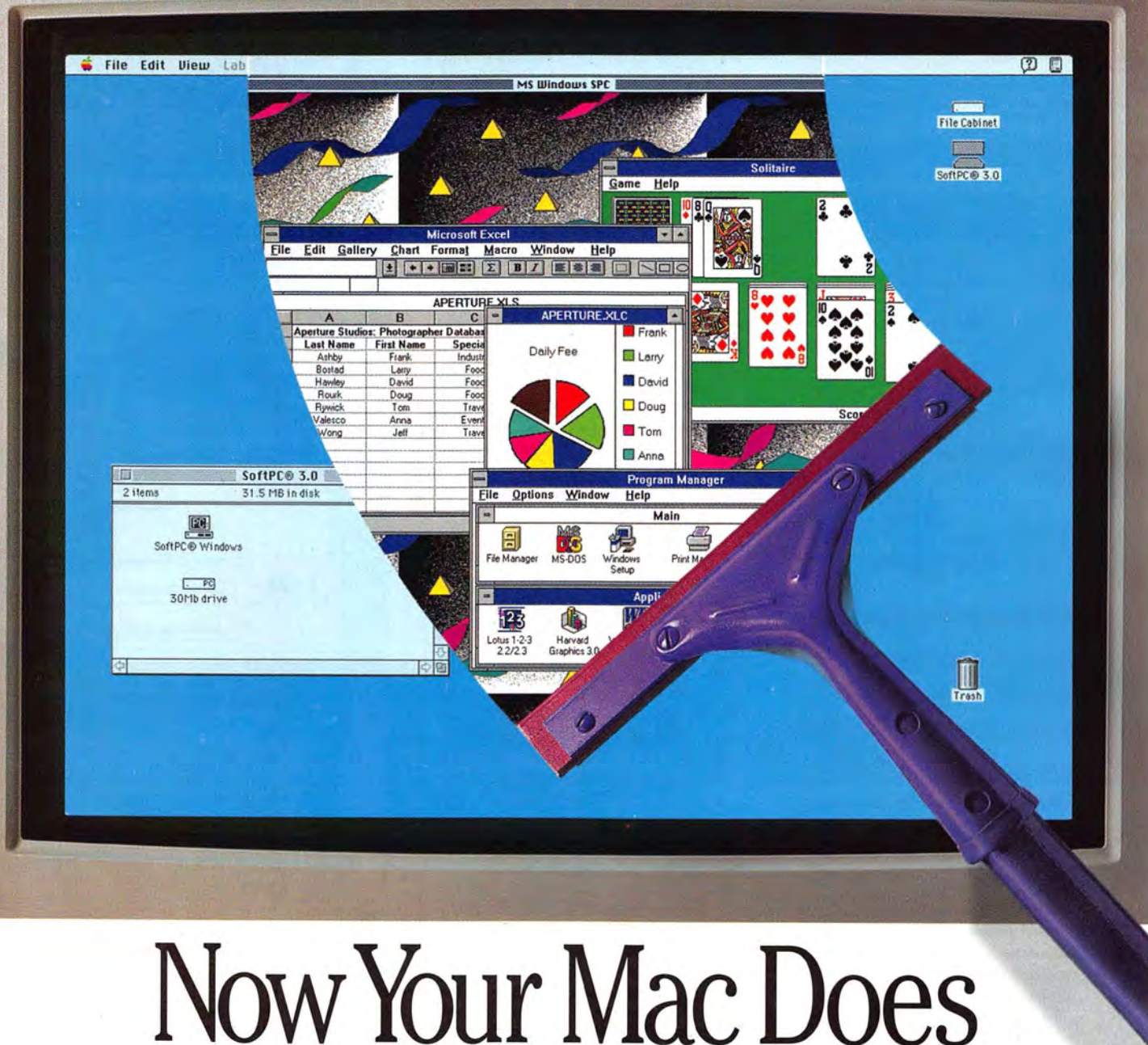
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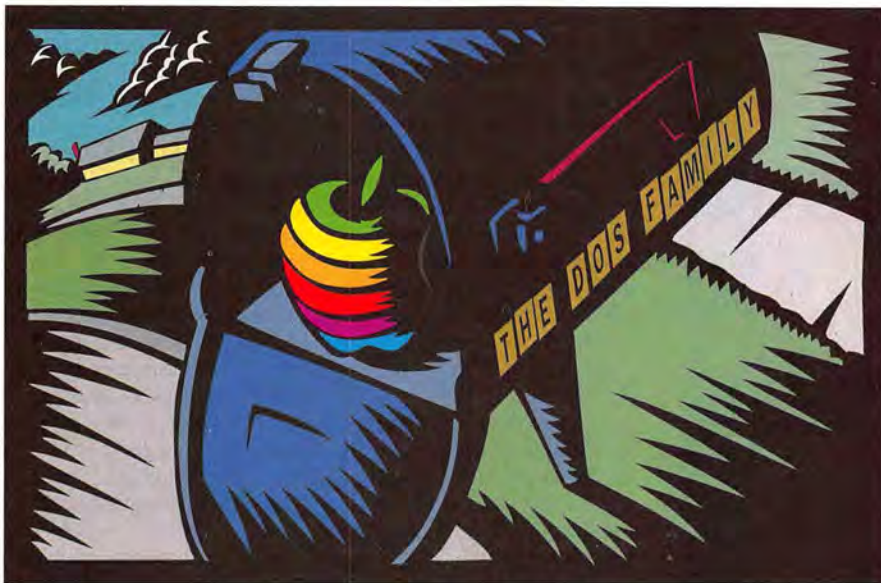
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Easier E-Mail



*Sending electronic mail across platforms will become much easier this year.
That's definite. How it will happen is a little less certain.*

By John Rizzo

Imagine for a moment that instead of having one answering machine sitting on your desk, you have seven or eight. One records local calls. Others take calls from people using AT&T, MCI, Sprint, and pay phones. To make things worse, each answering machine is made by a different company and requires a different set of commands for playing and erasing messages. But wait, there's more — to make a call, you have to already know the telephone number, because you can't always call directory assistance.

No, this isn't a description of Bulgarian Bell; rather, it's the current state of multiplatform messaging, the technology that lets users of different computer systems share electronic mail (E-mail) and user lists. There are three basic problems with multiplatform messaging: lots of different (and incompatible) mail systems for Macs, PCs, UNIX-based machines, and mainframes; too many user interfaces; and often-inaccessible directory assistance for mailing addresses on foreign mail systems, which means you can send messages only if you know the recipient's E-mail address.

Compatibility and accessibility problems can be partially solved by sending messages through a server running gateway software. With varying success, gateway software can translate mail and directory information between messaging systems. Although gateways are aided by industry messaging standards, the list of standards is unfortunately long — CMC, MAPI, MHS, OCE, VIM, VINES, X.400, X.500 — and it's

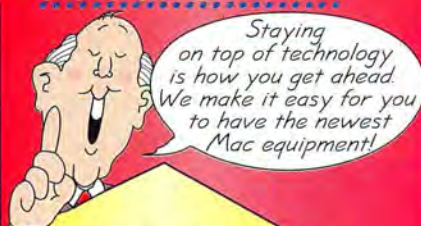
getting longer all the time. A single industry standard with which every system is compatible would be best, but different industry players have different ideas about what the standards should be.

Gateways Galore

Before getting further into the problems of messaging, let's take a look at the current possibilities. The simplest situation is one in which Macs and PCs run LAN-based E-mail packages from the same vendor. Gateways for connecting the PC and Mac versions of CE Software's QuickMail and Microsoft Mail are offered by the program manufacturers. Lotus' cc:Mail is the easiest-to-use multiplatform mail package, because it doesn't require a gateway: It allows Mac, PC, and UNIX-machine users to send each other messages by accessing the same server (see review, January '93, page 52).

For those who don't have the luxury of using the same mail system on Macs as well as PCs, gateways such as MailLink MHS (\$395 and up) from StarNine Technologies (510-649-4949) can link QuickMail and Microsoft Mail to the legions of PC mail systems based on Novell's MHS (message-handling service). Another StarNine product, MailLink SMTP (\$595 and up), provides a gateway to UNIX-based E-mail. If you want to connect to X.400-based mail systems (popular in VAX, UNIX, and PC networks), you can use Mac X.400 server software (\$3,000 and up) from Apple (408-996-1010).

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And if you just happen to have a VAX lying around, you can use host-based products such as Pathworks (no price available at press time) from Digital (508-493-5111) and AlisaMail (\$10,000) from Alisa (818-792-9474). AlisaMail uses a database to share directories with Mac-based and PC-based E-mail systems and to update the directories.

Also available are gateways that connect your LAN-based E-mail system to telecommunications services such as CompuServe and MCI Mail. Unfortunately, telecommunications gateways usually don't let you look up user names from within your local mail system; if you need to find an address, you still have to use a telecommunications program and a modem to log on to the service directly.

You can share local directories from other E-mail systems by using StarNine's MailLink Directory Services (\$2,995), which gives users access to E-mail-system directories. Version 2.0, due out in the first half of this year, adds directory synchronization, a feature that lets mail servers update each others' user lists to reflect changes made by local administrators. The new release will work with QuickMail and Microsoft Mail, with an option for cc:Mail, but future add-on modules (expected to cost less than \$3,000 apiece) will allow directory synchronization with Microsoft Mail for PC, MHS-based systems, UNIX mail services, and the like. MailLink Directory Services 2.0 will also let you format any database (a list of employees or network printers, for example) as a directory.

Unfortunately, no single gateway product completely fixes all multiplatform messaging problems, so the more types of messaging systems you connect, the more gateways you need. Hence troubleshooting and maintenance are more complex, as is the creation of enterprisewide software.

OCE Access

Apple's OCE (Open Collaborative Environment), expected to be released in the next few months as a set of System 7 extensions, will address the three basic messaging problems.

1. Connections. OCE reduces the number of gateways necessary by allowing users to install extensions that can connect the Mac to servers running LAN-based and mainframe-based E-mail software, fax machines, and pagers. Apple

will write some of these extensions, called Service Access modules, while providing a single API (application-programming interface) so that third-party software developers can write others.

2. Multiple interfaces. OCE solves the interface problem in two ways. First, using the OCE API, developers can enable their applications to send messages so that users can choose any interface for any type of message. Second, all incoming messages — whether from CompuServe, cc:Mail, or even fax machines — will arrive via a new Mailbox icon on the desktop.

3. Directory assistance. OCE allows you to access multiple directories by clicking on a new icon on the desktop. The directory volume will contain lists of network users as well as of network services. OCE also provides other messaging goodies, such as automatic encryption and decryption of messages traveling over the network.

All of this is great for Mac users, but what about other platforms? Apple has said that it will port OCE to other platforms, and a good candidate is Windows. Although there are a lot of copies of Windows in use, its messaging capabilities are flawed. Apple hasn't yet said how much of the OCE golden egg it is willing to make available to Windows — platform correctness is all very noble, but Apple doesn't want to risk hurting Mac sales by helping improve Windows too much.

VIM and Vigor

In fact, Apple is supporting a true multiplatform standard called VIM (Vendor Independent Messaging), which is compatible with OCE. Although it's not quite as fancy as OCE, VIM does provide multiplatform directory services, and like OCE, it solves the multiple-interface problem by bringing messaging features to applications. It also provides a single API for the Mac, DOS, Windows, OS/2, and UNIX platforms, something applauded by developers who would rather not keep rewriting the same software for every operating system they want it to work with.

VIM was created by Apple, Lotus, and Borland; it has the support of IBM, WordPerfect, and Novell. One player is notably missing: Microsoft, which is not supporting VIM, for reasons that have more to do with the interests of Microsoft than those of users or developers.

Microsoft, you see, has its own multi-platform messaging API called Simple MAPI, which grew out of the ability of Word and Excel to send messages via Microsoft Mail. But Simple MAPI provides rudimentary messaging without directory services and is thus not the solution to all our messaging problems.

Microsoft has announced a beefier messaging API called Extended MAPI, which is supposed to have capabilities similar to Apple's OCE. Extended MAPI, however, is not an open standard but a specific feature of Microsoft's new Windows NT operating system, aimed at the workstation and server markets.

With Simple MAPI being, well, simple, and Extended MAPI being a feature of NT only, there doesn't seem to be much reason for Microsoft not to support VIM. However, Microsoft is active in a group called XAPIA (the X.400 Application Programming Interface Association), which has a long list of industry members. XAPIA is working on a standard called Common Mail Calls (CMC), an extension of the X.400 standard that will be similar to VIM. Microsoft has said that CMC may eventually replace Simple MAPI. CMC won't exist for a while, however.

VIM, on the other hand, exists now. Lotus (617-577-8500) started shipping its VIM Developers Toolkit (\$395) last September, and Lotus Notes and cc:Mail are VIM-compatible. So is Apple's OCE, which means that any Mac OCE-compatible application (such as Excel) can communicate with VIM-compatible applications on PCs. Apple has been demonstrating OCE (originally called Apple Mail) for almost a year now.

By not supporting VIM, Microsoft may be saying that VIM just isn't good enough, or it may be stalling for time to develop a messaging standard that is more favorable to Windows. As the magazine *PC Week* said recently, Microsoft has almost enough power to call the standards race moot and declare a messaging dictatorship. Without Microsoft, which has the biggest monopoly since the breakup of AT&T, software vendors are reluctant to jump on the VIM bandwagon.

In the meantime, OCE will not only improve but also transform the way Mac users send and receive messages. Microsoft realizes this and is among the first to have created OCE-compatible applications. Adopting OCE is the best thing Mac users can do to simplify and en-

hance their E-mail interface to work with the rest of the E-mail world. The destiny of VIM, which puts PC users on something closer to an equal footing with OCE users, is less certain and depends on how quickly Microsoft develops its own sys-

tem. At the moment, it seems that Microsoft just doesn't want to play ball — it wants to build its own stadium. ☐

John Rizzo, a *MacUser* technical editor, is the author of *MacUser Guide to Connectivity*.

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PERSONAL MACINTOSH

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long-standing policy, **Apple is selling direct** — and not just its own products but also a few from selected vendors such as Kensington, Aldus, and (surprise, surprise) Claris. The toll-free number (800-795-1000) and free next-day delivery are just what you'd expect from any mail-order company; the prices, however, aren't. Expect to pay full retail for the privilege of buying from the Mother Ship. But the carrying case is still a sweet deal at \$75, and you can add some \$24 Apple sweatpants to your order.

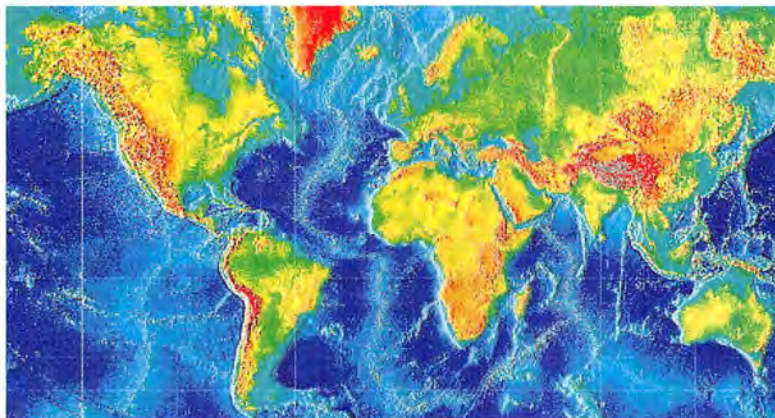
Multimedia make-overs: Grabbing a volume off the reference shelf and transforming it into a multimedia Mac extravaganza can be a risky business. Grolier's \$395 MultiMedia Encyclopedia, for instance, is the first Macintosh CD-ROM from a company with a high profile in the DOS world. Unfortunately, what the designers don't know (or care) about the Macintosh interface could

fill an extra volume. Still, stylishness probably isn't top priority for a product that's replacing a bunch of dusty old books. 203-797-3500. ♦ People who love maps and atlases, though, will be thrilled by The Small Blue Planet, an integrated collection of world maps. This \$199 CD-ROM from Now What Software has information and **stylishness to spare**. What's most striking is the sheer beauty of the images, which all come from public-domain sources such as the National Oceanographic and Atmospheric Administration, the Defense Mapping Satellite Program, and NASA photos. 415-885-1689.

Song medicine: Ars Nova's Songworks is a MIDI-friendly application that enables you to quickly notate, harmonize, and print songs. It includes a spiffy **Paula Abdul feature** for future stars whose musical talents don't include singing, playing, or composing: Songworks will create and harmonize a melody for you. 206-889-0927. \$125. ♦ So You Want to Be a Rock and Roll Star is a \$99.95 CD-ROM from Interactive Records that adopts a hands-on, multi-



media approach to teaching you how to fake your way through six oldies on guitar or piano. Highly recommended for laser karaoke fans and '96 challengers to President Clinton. 415-285-8650. Ⓜ



By James Bradbury



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Personal Communicators



EO's pen-based Personal Communicator 440 and 880 will let you communicate on the run with practically anyone — except for a Mac user.

By Henry Bortman

I'd like to be writing a column about Newtons — you know, the Personal Digital Assistants that Apple first announced would be so consumer-oriented that you'd practically be able to buy them at Radio Shack for your kid's next birthday and then turned around and confessed would probably be business productivity devices after all. The ones over which Apple is having a trademark war with Nabisco to settle once and for all whether an Apple Newton is a cookie or a computing device.

I'd like to be telling you about Newton's wireless-communications capabilities. I'd like to be giving you advice on how to connect your Newton to your Mac, where you can get translators for moving data from applications that run on one machine to those that run on the other, and how to synchronize the information you store on the two machines. I'd like to be listing prices and ship dates, showing you pictures of circuit boards and I/O ports and all the stuff that would lead you to think there's a real product coming real soon.

But Apple isn't talking.

So instead I'm going to tell you about EO's Personal Communicators. Unlike Apple, EO (415-694-7337) has announced products and ship dates. This makes the Personal Communicators infinitely more interesting than Newtons, at least temporarily. EO will likely be the first to ship what the entire computer industry has been promising for the last two years: a communications-centric portable computer. But I'm also going

to rant and rave, because although the staff of EO as well as GO (the company that licenses PenPoint, the Personal Communicators' operating system) are riddled with former Apple employees and Mac enthusiasts, Personal Communicators will have near-zero connectivity with Macs when they first ship.

What They Are

The EO Personal Communicators are what you get when you cross a telephone, a fax modem, and a pen-based computer. They are computers — don't let anyone tell you differently. As such, they can be used in general-purpose computing areas such as word-processing, spreadsheets, drawing, and appointment calendars. But their design is optimized for mobile messaging and communications.

There are two models: the 440 (\$1,999 to \$2,799, depending on configuration) and the 880 (\$2,999 to \$3,299). Both are based on AT&T Microelectronics' 92010 Hobbit processor. The Hobbit is a RISC-based microprocessor that, because it draws very little power, is ideal for use in machines that run off batteries. The 440's processor runs at 20 megahertz, the 880's at 30 megahertz. They're fast.

The 440 is the little guy: It weighs only 2.2 pounds with a standard four-hour NiCad battery (2.4 pounds with an optional seven-hour battery) and measures around 11 x 7 x 1 inches (see Figure 1). Its 640-x-480-pixel reflective screen measures 5.9 x 4.3 inches. That comes out to 110 dpi. With such a small screen,

you might think the legibility would be terrible. But under normal lighting conditions, the screen is stunning — and I say this as someone who *hates* reflective screens. On the unit EO demonstrated to *MacUser* back in November 1992, even 7-point type was perfectly readable under standard office fluorescent lights. Of course, if you work in the dark, you might be a little disappointed. The 880 is larger (13 x 9 x 1 inches) than the 440, with an 85-dpi backlit screen that measures 7.6 x 5.7 inches. It weighs 4 pounds.

The 440 and the 880 each provide serial and parallel ports, a keyboard connection, a communications port for attaching an optional cellular phone, and a PCMCIA (Personal Computer Memory Card International Association) expansion slot (the 880 has two). Both are available with an optional internal V.32bis fax/data modem (14.4 Kbps for data and 9,600 bps for fax). The 880 has video-out capability (VGA) and a SCSI II connector.

The optional CellPhone module (\$799) attaches to the bottom of either the 440 or



Figure 1: EO's Personal Communicator 440 (shown here) and 880 are lightweight, mobile pen-based computers optimized for voice, data, and fax communication over standard and cellular telephone lines.

880 and, as you might expect, enables data communications over a cellular connection. If you connect a standard telephone handset to the jack provided on the CellPhone module, you can make cellular voice calls.

The bundled software includes not only the PenPoint operating system but also

E-mail, fax, and basic note-taking software from GO; sound-record-and-play-back, pen-based calculator, voice-phone, and security software from EO; Personal Perspective (a combined calendar, to-do-list, and address-book application), from Pensoft; and PenTops/PenCentral, from Sitka, for sharing files with PCs. Almost all of this software, along with the operating system, is in ROM — 8 megabytes' worth.

When you buy a Personal Communicator, you get a free AT&T Mail account — well, sort of free. You don't have to pay any sign-up or monthly fees. You do still have to pay for the call you make when you use the service to send and receive E-mail and to receive faxes. Why AT&T Mail? Well, when you're building a communications-centric computer and the company from which you're getting the computer's microprocessor also just happens to own the nation's largest long-distance telephone system, complete with its own electronic-messaging service, odds are you're going to cut some

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kind of deal. Besides, if the people you need to communicate with don't also happen to be AT&T Mail users, its gateways to the Internet, CompuServe, GE Info Services, MCI Mail, SprintMail, Novell MHS, and cc:Mail should meet most of your needs — unless the people you need to communicate with are Mac users.

What They Aren't

Let's start with E-mail. If you will kindly refer back to the list of gateways in the previous paragraph, you will find among them Novell MHS and cc:Mail, which together are implemented by the overwhelming majority of LAN-based E-mail users — on PCs. But you don't see QuickMail or Microsoft Mail, which are the dominant LAN-based E-mail packages among Mac users.

Then there are file-sharing services. EO offers PenTops (client software for 440s and 880s) and PenCentral (TOPS-server software that runs on a PC). So a 440 or 880 can be connected by a serial cable or modem to a PC and, using TOPS

Remember what Deep Throat advised Woodward and Bernstein as they unraveled the Watergate scandal? 'Follow the money.' And the money is in PCs, not Macs.

protocols, copy shared files to and from the PC. But to get to any other type of shared files with a Personal Communicator, you have to use PenCentral as a gateway. So even if you have a Mac running TOPS file-sharing software (a rare occurrence in the age of System 7 file sharing), you can't access files on the Mac directly from the EO computers.

Perhaps you're wondering about printing. Well, because AppleTalk isn't supported, neither is direct network access to PostScript printers. But that's not the end

of the story. The PenPoint operating system used by EO doesn't provide a PostScript driver at all, even for serial or parallel connections. It knows how to talk to HP LaserJets and LaserJet wannabes only.

Now, something is wrong with this picture. Here we have what is arguably the most advanced mobile pen-based computer yet produced, a computer designed for communications. But it has nothing to say to today's most advanced desktop and notebook computer, the Mac. Nor can it be connected to the networks on which some 70 percent of those Macs reside.

The reason is fairly simple. Do you remember what Deep Throat advised Woodward and Bernstein as they tried to unravel the Watergate scandal? "Follow the money." And the money in the computer market is in the installed base of PCs, not Macs. Or so conventional market wisdom goes. I'm not so easily convinced. There's a reason why EO and GO have a lot of former Apple employees on

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their staffs. And it's the same reason why Mac users are far more likely to adopt the new technologies EO and GO are promoting than people who have been content with DOS for the last five years and who think Windows makes PCs just like

Macs. The reason is that Mac users are early technology adopters.

Let's hope someone fixes this mess — and soon. EO and GO both say they're committed to providing AppleTalk and Mac connectivity, but that isn't news. It

would be far more inspiring to hear them announce a ship date.


There is another hope. CoActive, a company based in Belmont, California, is developing software to provide AppleTalk file-sharing and print services for a variety of computing environments in which they are currently unavailable. EO's Personal Communicators are expected to be among the devices that will benefit from CoActive's work. Stay tuned.

On an Upward Spiral

On another note, one of the more intriguing applications worth the notice of any PowerBook user is Spiral (\$129), from TechWorks (512-794-8533). You can think of Spiral as a minimalist word processor optimized for note taking, with a dash of hypertext. Its focus is on helping you organize things you jot down during the course of a day rather than on editing, formatting, spell-checking, and grammar-checking word-processed documents.

Documents created with Spiral are called notebooks and can be any of three predetermined sizes: The largest (640 x 480 pixels) fills a PowerBook screen; the smallest (350 x 200 pixels) fills about a quarter of the screen. Once you've selected a notebook's size, you can't change it. Pages in a Spiral notebook behave somewhat differently from pages in a word processor — they don't scroll. If you type more text than can fit on a page, Spiral will cut the last few lines of text from the page, create a new page, and paste the overflow text onto the new page.

Notebooks are organized into sections. When you create a new section, Spiral creates a section-contents page and displays a tab sticking off the right-hand edge of the notebook that takes you directly to the contents page. As you type, you can select phrases to copy to the contents page. Clicking on a phrase on the contents page takes you directly to the page on which the original text appears. There is also a page-navigation tool that is creatively integrated with the Find command to speed up locating the information you're looking for.

Spiral's creators have shown the courage to do what few application developers are willing to: to pick a single purpose for an application and do it well without worrying about all the detractors who will complain about the features it lacks. Spiral is definitely worth checking out. 

Henry Bortman is *MacUser's* technical director.

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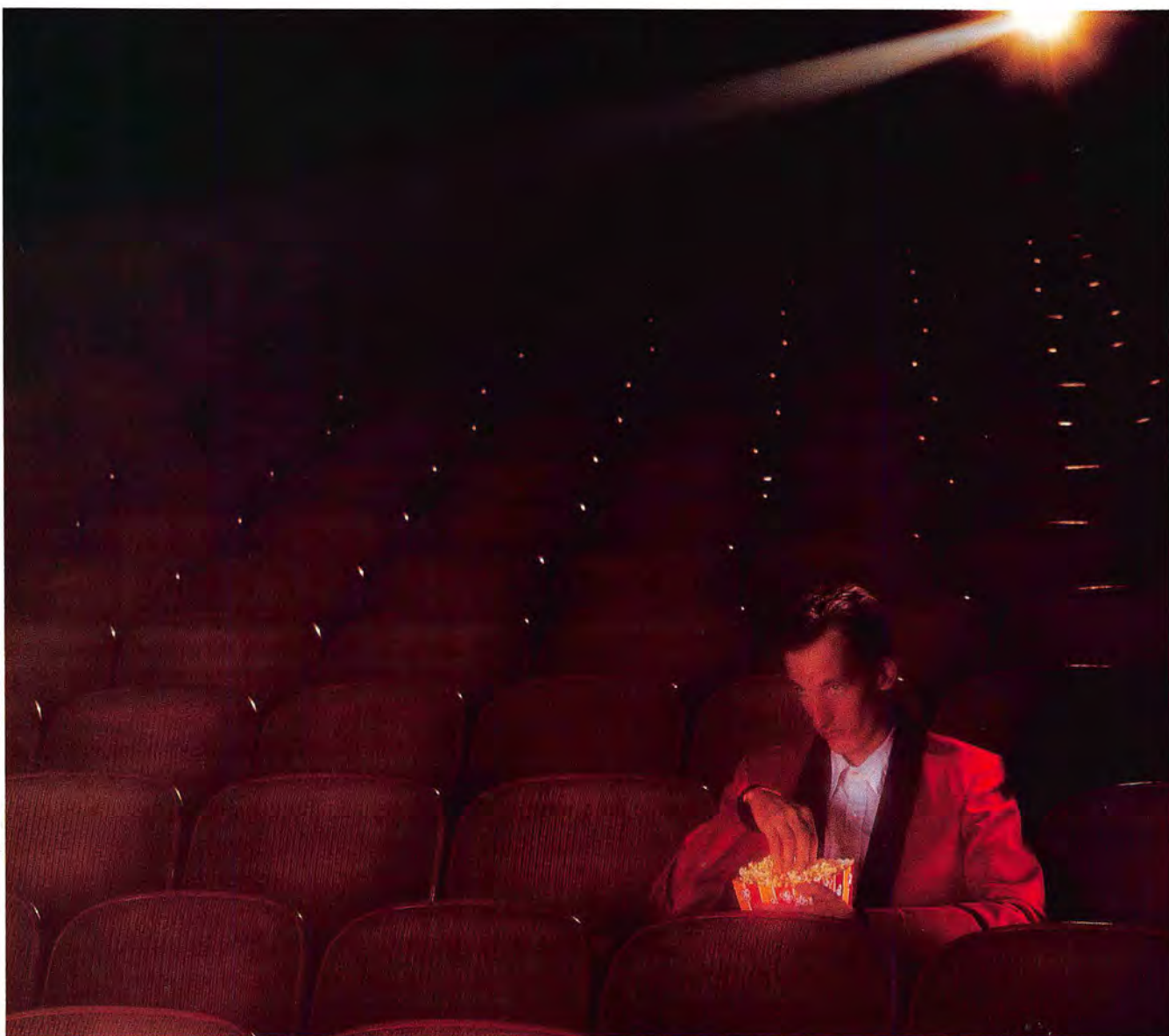
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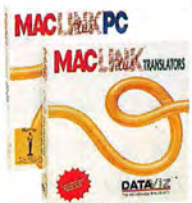
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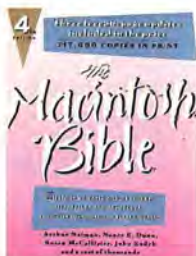
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POWER TOOLS



Indispensable utilities:

The fourth edition of the classic Mac reference book *The Macintosh Bible* is now available in bookstores along with a set of companion disks. If you're one of the few Mac users who doesn't already have a copy of this useful book, now's the time to scrape together \$32 and get one. If you're a user-group member or have access to an on-line service, you might want to skip the Macintosh Bible Software Disks, but they're not a bad deal for new Mac users. For \$25 you get two indispensable utilities — the virus checker Disinfectant and the compression program Compactor — plus almost 3 megabytes of other shareware and freeware to play with. 510-548-4393.

Back it up: If you haven't been backing up your data regularly, the recent influx of new and upgraded backup software has just destroyed your last excuse. FastBack Plus Mac 3.0 (\$189), from Fifth Generation Systems, offers increased tape support and an erase feature that lets you **trash selected files** without backing them up first; FastBack Express (\$99) is for users who don't need to back up to tape. Both programs can read files backed up with FastBack's DOS and Windows versions. 504-291-7221. ● FileDuo

(\$149), from ASD Software, performs unattended backups to any mountable volume. Because each file is an exact duplicate of the original, no restoration is required. 714-624-2594. ● Dantz Development (maker of Retrospect and DiskFit Pro) has added a basic backup utility to its distinguished line with

DiskFit Direct (\$49.95). Users can back up to floppies or any other removable media, including opticals and flopticals. Backups are stored in Finder format for easy retrieval. 510-849-0293.

Fill 'er up: You can reuse empty ink cartridges from your HP DeskWriter C color printer with Graphic Utilities' Ink Refill kit. The kit contains a modified cartridge containing cyan, magenta, and yellow ink and three refills of each color (or you can buy the ink refills without the cartridge). Not only is this method substantially **cheaper than new** cartridges but it's also a lot kinder to the environment. 617-890-1818.



Network news: Casa Blanca Works has just released DriveShare, a control panel that lets you share removable drives — SyQuest, Bernoulli, optical, and CD-ROM — over an AppleTalk network. Not all drives are yet supported, and only one user can access a disk at one time, but DriveShare gets around System 7 file sharing's inability to eject a shared disk. A 5-user pack costs \$199.95; a 10-user

pack costs \$299.95. 415-461-2227. ● If you'd like to **give your photocopier a rest**, Casady & Greene might have just the package you've been looking for. Snap Mail (\$125 for a 5-user package) is a peer-to-peer E-mail program that's a snap to install and requires



next to no maintenance. This unsophisticated little package won't put QuickMail or Microsoft Mail out of business, but it's a cheap and easy answer for small offices that want to do away with SneakerNet. 408-484-9228. ☐



By Victoria von Biel

How Butterflies Transform

The butterfly passes through several stages in its glorious transformation from egg to the completed creature that we all visualize as the butterfly. The adult female lays between one hundred and several thousand eggs throughout her lifetime each with the potential of becoming an adult butterfly itself.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid on or near a plant on which the newly hatched grub will be able to feed. These eggs are often green or yellow, but can also be found in shades of blue or red, each with a shell like design covering it.

Usually in the spring or summer a tiny caterpillar, or grub, will hatch from the egg. This wormlike creature almost immediately begins to feed as it will consume the majority if not all of its nutrients during this phase of its life.

The caterpillar will continue to eat until it has eaten so much that its skin can no longer contain the newly acquired mass. The skin then hardens and the caterpillar will shed it in order to have it replaced by a newer and larger one. This process continues for weeks as the caterpillar increases in size, several times its original mass.

Often during the time of fall, the caterpillar will then either spin a silken pad from which it suspends itself by its hind legs or it will fasten its body upright by silken threads to a twig creating a chrysalis or exposed pupa. Usually after spending the winter months dormant, the final stage of transformation will take place.

The shell of the chrysalis is broken open and the creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and kept close to its moist limy body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.

It moves its wings slowly at first with little strength but as they dry it is soon ready to take flight. The creature that ascends into the air has been through its final stage of development and is now the completed butterfly. This butterfly is now called the imago, or perfect insect.

How Butterflies Transform



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System 7 Required



Here are four cool new utilities that promise to make System 7 better, faster, and more fun to use.

By Bob LeVitus

I admit it: I'm obsessed with utilities that make it easier to use my Mac. If I don't load all of my little goodies — a row and a half of their icons marching merrily across the bottom of the screen each time I boot — my Mac seems naked and crippled. Because I'm always looking for the next great utility, I had a lot of fun this month reviewing four new packages, all of which enhance System 7.

First out of the chute is Adam Stein's excellent shareware contribution System 7 Pack. Next is 7th Heaven, from Logical Solutions, an interesting but flawed collection of programs. Then on to Sharon Zardetto Aker's *Xtras for System 7*, a "bookware" collection featuring 13 original utilities. Finally, we'll look at Super 7 Utilities, an ambitious utility collection with a couple of unique components.

System 7 Pack

System 7 Pack is a sizzling shareware offering that performs several ResEdit-like tasks without the fuss and bother of ResEdit. For one, it allows you to add a Quit menu to the Finder. Quitting the Finder frees up 200K to 300K of RAM, making more memory available to your applications. This is just what the doctor ordered when you need just a little more RAM to open that next program.

Another useful feature is Application Substitution, a cool trick I first saw in the commercial program HAND-Off, from Connectix. Application Substitution allows you to choose an

application to open documents that, if you tried to open them, would otherwise give you the dreaded "an application can't be found . . ." dialog box.

You can also change the Finder's rename delay, the amount of time (normally too long) the Finder waits after you click on a filename before it allows you to change it. The choices for rename delay range from Very Long to None.

System 7 Pack has several other nifty features. You can turn off the Finder's ZoomRects, the zooming animations that slow down the Finder every time you open a window. This utility also lets you add keyboard command equivalents for menu items in the Finder that don't already have shortcuts, such as Make Alias and Empty Trash.

Perhaps System 7 Pack's best feature is its ability to force the Finder to copy files faster, which it does by increasing the block size and making more memory available to the Finder. In very casual testing (copying a 5.2-megabyte folder containing more than 100 files from one hard-disk volume to another), I saw a 100-percent performance improvement — the folder copied twice as fast — after using System 7 Pack.

Although most of these hacks could be performed with ResEdit (see *Beating the System*, January '92, page 207, and Help Folder, May '92, page 239), System 7 Pack is just as good and a lot easier to use. Another plus: The instructions are thorough and clear.

System 7 Pack is shareware, which means that you can try it

BEATING THE SYSTEM

before you pay for it, but some of its features are disabled until you pay the \$29.95 registration fee. An unregistered copy, for example, lets you use only the letters A to L as Command keys, whereas a registered copy lets you use just about any key on the keyboard. System 7 Pack is shareware worth paying for. Its author, Adam Stein, is in his first year at the Wharton School of Business, and proceeds from System 7 Pack help pay his college costs — so check it out, and then send Adam a check. I did.

Unlike extensions or control panels that load at startup, System 7 Pack is an application that makes *permanent* modifications to your Finder. Hacking your Finder is powerful juju. You can do lots of really cool stuff, but you can also crash your Mac big-time. Always make a backup before using System 7 Pack, ResEdit, 7th Heaven, or any other program that modifies the Finder. That way, if something goes wrong (which *can* happen, as you'll see in the next review), you can just replace your trashed Finder with your backup copy.

7th Heaven

7th Heaven is, appropriately enough, a collection of seven utilities for System 7. As with System 7 Pack, several of 7th Heaven's modules modify your Finder (and one modifies the System file itself), so caution is in order when you're using this utility package.

FinderExpress is the centerpiece of the collection, but it's just a pale imitation of System 7 Pack. Like System 7 Pack, FinderExpress lets you make the Finder copy files faster by increasing the block size and making more memory available, and it also turns off the ZoomRects — but that's all it does. Unlike System 7 Pack, FinderExpress doesn't let you add Command keys, change the rename delay, or

add a Quit menu to the Finder.

I failed to notice that you're supposed to use 7th Heaven on an unmodified System and Finder only. This warning is buried in the manual; it *should* be in an alert box when you launch the installer. Because I'd mucked around with my Finder, using both System 7 Pack and ResEdit, my Mac crashed and died deadlier than a doornail when I installed FinderExpress — complete with the bad-news error tones and the sad-Mac icon. Fortunately, I always keep a backup copy of my Finder handy.

The best of the rest of the 7th Heaven utilities is Chameleon, an application that lets you choose from 75 colorful desktop patterns. Although Chameleon's patterns are beautiful and wacky (if you've ever wanted a wood-paneled desktop, here's your chance), I prefer Wallpaper, from Thought I Could Software. Wallpaper is a control panel that does what Chameleon does, but it includes a pattern editor and a "randomize" feature that changes your desktop pattern at intervals you specify — every minute, every hour, every restart, whenever. Chameleon requires that you use ResEdit or an equivalent if you want to create your own patterns, and it can't randomize patterns.

The supposed advantage of Chameleon (an application) over Wallpaper (a control panel) is that Chameleon uses less memory. The disadvantage is that Chameleon performs its magic by modifying one of the most important files on your hard disk, the System file. In my humble opinion, for this very reason, Wallpaper is safer and more flexible, even if it does need more RAM.

The other components of 7th Heaven include File Mapper, which is similar to System 7 Pack's Application Substitution feature; Red Alert, which lets you colorize system-alert icons (big deal!);

and Informant, a low-powered system-configuration reporter. The remaining two programs are particularly lame: Vector Plasma is a bland little screen-saver application, and Calendar is one of the most useless calendar programs I've ever seen — it does nothing more than tell you what day it is, hardly the best use for your Mac.

In my opinion, System 7 Pack plus Thought I Could's Wallpaper (\$39) are a better value than 7th Heaven.

Xtras for System 7

Sharon Zardetto Aker's *Xtras for System 7* is a new software concept called bookware. It's a book with an enclosed disk (as opposed to a disk with an enclosed manual), and you're more likely to find it at a bookstore than at a software dealer. But, unlike most book-and-disk offerings (including my *Stupid Mac Tricks* and *Son of Stupid Mac Tricks*), *Xtras for System 7* isn't a compilation of warmed-over shareware. Instead, it's 13 original programs, written specifically for inclusion in this package. The introduction informs you that "the software costs \$25; the book is free."

It's a good collection too, enhanced by its low \$25 price — less than \$2 a program. Unlike most other book-and-disk sets, it has no hidden costs and no shareware fees to pay.

Perhaps the most useful component in the *Xtras for System 7* set is The Big Apple, which adds submenus to items on your Apple menu, lets you change the order in which the submenus appear, and provides the ability to open all the items in a submenu (that is, all the documents and applications in a single folder) at once. The Big Apple also lets you choose a different font for your submenus, although it doesn't change the font of items on the Apple menu (and on all other

Directory

	7th Heaven 2.0	Super 7 Utilities 1.0	System 7 Pack 3.0.1	Xtras for System 7 1.0
	\$\$\$	\$\$\$	\$\$\$	\$\$\$
List price	\$99.95	\$99.95	Shareware, \$29.95*	\$24.95
Company	Logical Solutions, Inc. 2124 University Ave. Ste. 102 St. Paul, MN 55114 800-645-2495 612-659-2495	Atticus Software Corp. 455 Hope St. Ste. 3E Stamford, CT 06906 203-324-1142	Insanely Great Software 126 Calvert Ave. E. Edison, NJ 08820	Addison-Wesley Publishing Co. One Jacob Way Reading, MA 01867 800-447-2226 617-944-3700

* Available from user groups and on-line services. On ZiffNet/Mac, download 7PACK.CPT from Library 1 in the Download & Support Forum.

menus) the way NowMenus does. Still, it's a serviceable hierarchical Apple-menu utility (and the price is right).

The other components of this package include Icon Editor, a full-color mini painting program for icons. For those who mess with icons often, using Icon Editor is a lot better than working in a color painting program.

Publishist is a Scrapbook replacement that supports System 7's Publish command so you can publish pages — nifty if you use publish-and-subscribe.

IntoApple instantly places an alias of any file on your Apple menu (or any folder). Just drag the file onto IntoApple's icon, and presto — an alias appears in the proper place.

LabelMaker lets you add Finder labels (the ones on the Label menu) to files from within the Save dialog box in any application. PopApp is an application menu (similar to the one in the far-right corner) that you can pop up anywhere by clicking your mouse while holding down the appropriate modifier keys. SpeedName lets you adjust the rename delay.

The rest of the utilities perform Trash-management tasks: Compost empties your Trash automatically at intervals you specify, Incinerate erases files immediately when you drag them onto its icon, Shred•It is a secure eraser, and Empty-Trash empties the Trash automatically when you start up your Mac.

The 13 components of *Xtras for System 7* are thoughtfully designed and perform as promised. Even if only two or three of them appeal to you, the package is a good deal.

Super 7 Utilities

This is an ambitious and mostly successful package. My favorite of the seven utilities is Mighty Menus, which provides tear-off menus, giving you the ability to drag any menu from the menu bar to any location on-screen. The program remembers torn-off-menu locations when you quit a program and restores the menus to them when you relaunch it. Mighty Menus is surprisingly handy, especially if you have a large monitor.

Printer Picker is another winner. It adds a Printer menu to the menu bar, letting you select a printer — even across zones — without opening the Chooser. It also lets you select default printers for specific applications. If you have access to several printers at once, you'll love it.

Helium Pro, a beefed-up version of the

popular Helium shareware program, lets you turn Balloon Help on and off from the keyboard or turn it on momentarily for a quick peek at a Help balloon. It also lets you change the font and size of the balloon text. I liked the Helium shareware program enough to pay for it; Helium Pro is even better.


Desktop Extras adds to the Finder a new menu that allows you to select a file and then choose Copy, Move, Make Alias, or Move to Trash. It also adds keyboard shortcuts for these actions.

The other three utilities are interesting and may be useful, but they're not as flashy as the others described above. Speed Beep Pro lets you add new sounds and

You're more likely to find the new software concept bookware — a book with an enclosed disk — at a bookstore than at a software dealer.

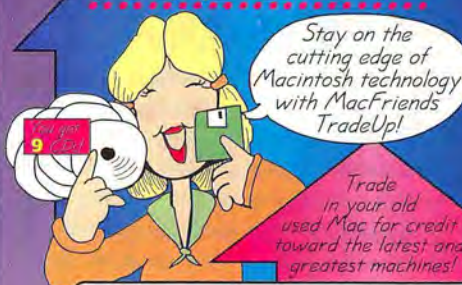
randomize your beep sound; Super Comments displays Finder Get Info comments in Open dialog boxes, lets you create Finder Get Info comments from within the Save and Save As dialog boxes, and preserves Finder comments when you rebuild the desktop; and Trash Alias detects orphaned aliases and asks if you want to delete the about-to-be-orphaned aliases when you delete the original file.

Helium Pro, Super Comments, Trash Alias, and Speed Beep Pro all originated as shareware, but they are now available exclusively in the Super 7 Utilities package. Registered users of the shareware versions receive free technical support from Atticus and can upgrade for \$49.95.

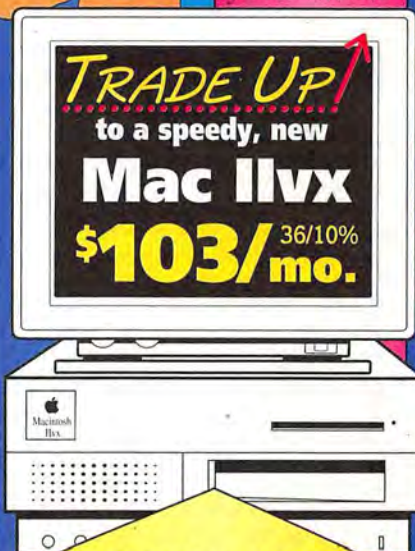
This is the first release of Super 7 Utilities (by contrast, Now Utilities is now in version 4.0.1), which is to say it's not quite perfect. I noted several anomalies, mostly cases in which one of the Super 7 Utilities didn't get along with one of my other utilities. And some activities in Microsoft Word seemed slower when I had torn-off menus on-screen. Even so, if any of its utilities sound good to you, give Super 7 Utilities a try. Even with its blemishes, it's an impressive effort. 

Bob LeVitus is the author of *Dr. Macintosh* and *The Dr. Macintosh Guide to the On-Line Universe*.

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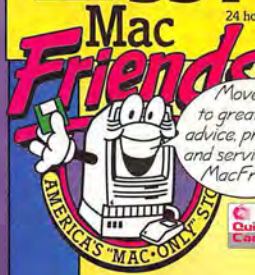
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Nobody ever said you had to live in Cupertino to be a Macintosh expert. Know-it-alls are everywhere, from Manhattan to Malibu — even in Waldport, Oregon, where we found our own Mac guru, Philip Russell. Each month Phil shares his own tips plus the best of the 70-odd Macintosh-user-group (MUG) magazines he reads each month. But Phil can't do it alone. To those whose undocumented Mac tip *MacUser* prints, we pay \$25, and the Reader Tip of the Month earns \$100.

Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. You can also contribute tips electronically via ZiffNet/Mac, the on-line service for *MacUser*. Send them to Gregory Wasson at 72511.36. Be sure to include your full name and mailing address along with the text of the tip.

By Philip Russell

Reader tips compiled by Gregory Wasson

■ When scanning to produce TIFF images for a 300-dpi laser printer, scan at 75 dpi for gray scale and photos (you don't get any better results at a higher resolution, and it takes longer) and at 300 dpi for black-and-white line art. Scan at 150 dpi for photos and gray scale that will be printed on a 1,200-dpi printer.

■ Comments in a file's or an application's Get Info box are seemingly harmless, but they do clog up the desktop, gradually slowing you down. See if you can't get along without them, or keep comments on your application's master disks but delete them as you move the application to your hard disk. If you really must have comments, try using a utility such as CE Software's DiskTop, which creates its own comments file.

A fast way to get rid of all Get Info comments is to rebuild your desktop. This is a good thing to do once in a while anyway. Hold down the Option and Command keys just as the last extension or control panel loads, and wait for the dialog box asking if you want to rebuild the desktop. Click on OK.

■ Here's how to print material from two applications on one laser-printer printout. Print from the first application, leaving room for the second application's material. Now start up the second application and hand-feed the first printout through the printer. I usually do two or three copies to allow for goofs.

■ When installing System 7, be sure to move non-Apple fonts, sounds, and DAs from the current system software (in the System Folder) into a folder elsewhere on the disk. You may need those fonts, DAs, and sounds after you've installed the new system.

■ To "digitize" a photo when you don't have a scanner, leave space for the photo and print everything else. Then paste the photo onto the printout and use a good-quality office copier to produce your final copy. If copier screens are available for enhancing the photo by imparting a dot pattern, try using them.

This technique isn't perfect, but it'll do in an emergency.

■ If your Mac II's fan is noisy, get some relief by moving any card in the No. 1 NuBus slot to the No. 6 slot, where it won't disturb the fan's airflow. First turn the power off and let the Mac cool down. Make sure you ground yourself with a grounding strap (available from any electronics store) when you start working inside the Mac.

■ If you're looking for better ImageWriter II output, try fiddling with the DIP switches. First note the current position of the switches, in case you decide the present setting is the best one. Next turn off the ImageWriter and change one DIP switch. Turn on the ImageWriter, and print a test page; mark this page with the new DIP settings.

Turn off the ImageWriter, and make one more change. Turn it back on, print, and mark the test page. Continue until you've exhausted the setting combinations. Pick the best setting, and leave your DIP switches set that way. The message is that Apple's technicians don't always set the DIP switches correctly. (Thanks to the MadMacNews, Madison, Wisconsin, MUG.)

■ For all those times when you want to move a graphic or a text block just a wee bit, try the Easy Access extension, which came with your system software. Easy Access lets you move a selected object one pixel at a time in any direction by using the keyboard rather than the mouse. Use Command-Shift-Enter to get into Easy Access mode, and then use the keypad to nudge the object one pixel at a time (the manual that came with your system software explains which keys you need to use to move the mouse).

■ Ever wish there were a Group command in PageMaker? Here's a partial solution: Import a logo without any text. Add the text in PageMaker. Select the logo and the text (hold the Shift key down to make a multiple selection). Cut the group or copy it to the Clipboard, and paste it into the Scrapbook. Return to PageMaker, and use the Place command to import the Scrapbook. Your selection will be grouped. The Place command is the secret;

Reader Tip of the Month: The Finder

Renaming files from the Finder can be a pain. In Icon view, you click on the file's icon and then wait forever for the filename area to become editable. To eliminate the delay, click on the filename and immediately move the cursor off the filename. The filename will almost instantly become editable.

If you are viewing files by name, size, kind, or date and want to change the names

of several files, you have to wait for the Finder to reorder the files after each rename, and that happens only when you click on the next file. To get around this, press the Enter key when you've finished typing; the Finder immediately reorders the filenames while you move the cursor to the next file.

Robert J. Lang
Pleasanton, CA

copy-and-paste doesn't group anything.

■ What happens when you paste a HyperCard button, field, card, or background into the Scrapbook? The Scrapbook retains all the properties, including scripts, icons, and graphics. You don't see the icons on the Scrapbook page, but they are there.

■ No good at math? Here's an easy way to convert a fraction of an inch to a decimal measurement in PageMaker when measuring in inches. Open Indents/Tabs, on the Type menu. On the ruler, click on the fraction you want to convert, as if you were inserting a tab. The correct decimal measurement will show up in the Position box. The bigger your page view, the more precise the decimal reading.

Reader Tips

Rebuilding the Desktop

In my never-ending search for System 7 shortcuts, I came across a quick way to rebuild the desktop. From the Finder, hold down the Command, Option, and Escape keys, and you get the dialog box for a forced quit. Click on the Force Quit button, and then hold down the Command and Option keys to rebuild the desktop. There's no need to restart your Mac every time you rebuild the desktop.

Gary Nelson
Longwood, FL

The Finder

Working in the Finder, I sometimes find I want to close all open windows but so many are open that manually closing them all is tedious. You can Option-click on the close box of one window to close them all, but you can avoid using the mouse by pressing Command-Option-W. All the open windows will close automatically, much faster than

you could do it manually.

John Collier
Wooster, OH

HyperCard 2.1

If, for whatever reason, you find yourself in need of a thorough breakdown of your Macintosh's configuration, there's an Easter egg in HyperCard 2.1 that can help. It's really simple: Just hold down Option and choose About HyperCard, on the Apple menu. The regular box appears, but it contains the following information: computer name, ROM version number, system-software version number, System-file size (in kilobytes), computer type, AppleTalk version number, QuickDraw version number, total RAM, application-heap size, largest contiguous free block, and A/UX version (if any).

Patrick Hearon
Hickory, NC

Photoshop 2.0.1

With a scanner, Photoshop, and System 7, you can place minipictures of your spouse, kids, dog, company logo, and the like on your desktop without wasting your precious disk space.

Scan the photo into Photoshop, and crop in tight around the face. Check the Save Preview Icons box under Preferences/General, on the File menu, and then save the image. Quit Photoshop, and open the Get Info window for the file (select the file in the Finder, and press Command-I). Click on the icon in the upper left corner of the window, and copy it (Command-C). Create a new folder on your desktop, open its Get Info window, click on the icon area, and paste in your new custom icon. Rename the new empty folder, and throw away the original Photoshop file. Simple, tightly cropped images work best.

Bryan Gray
College Place, WA

Word 5.0

The November 1992 tip about moving rows in a Microsoft Word table while in Outline view was the only way to go with Word 4.0, but that technique isn't necessary with Word 5.0. With Word 5.0, you can move a row in Normal or Page Layout view, just as you move any other text, with the drag-and-drop feature. Double-click to the left of the row to select the entire row, and then drag it to the position you want (make sure the arrow pointer is pointing to the left).

Shirley Kehr
Silverado, CA

Telecom

Under System 7, after you have downloaded a file to a folder that is open in the Finder and quit your telecommunications program, the file sometimes shows up as a generic document whose size is much smaller than the actual size of the file (2K is common size).

Never fear, your file is intact. Simply close the folder and reopen it, and the file should appear properly.

Christopher Kline
Baldwinsville, NY

[If you use a compression utility such as StuffIt or Compact Pro, you might encounter the same problem when saving a new archive to an open folder. The solution is the same: Close and reopen the folder, and you'll see the file's true size. — Ed.]

AppleTalk Remote Access

There's a fast and simple shortcut for logging in to AppleTalk Remote Access (ARA). First, open ARA and log in to your remote server as you normally do. Then select the file-server icon and make an alias of it. Put the alias onto your desktop. Now all you have to do is double-click on the alias, and you will

be logged in to the remote server automatically.

Craig Hirsch
Herndon, VA

Puzzle DA

There are actually two puzzles in the System 7 Puzzle DA. When you open it initially, you see only the Apple puzzle. But if you select Clear, on the Edit menu, while the Puzzle DA is active, a second puzzle, which uses numbers, appears. Choose Clear again, and the Apple puzzle returns. You can also paste graphics into the DA to create your own puzzles.

Nam-June Joe
Philadelphia, PA

AutoCAD 11

Recently Autodesk upgraded AutoCAD to version 11. This new version consumes what seems like an interminable amount of time to load a medium-to-large-sized drawing. You can speed it up significantly if, when you first start using the drawing editor and the drawing is being generated, you press Command-period or Control-C and then immediately type REGEN and press the Return key.

Russell Alexander
Columbus, OH

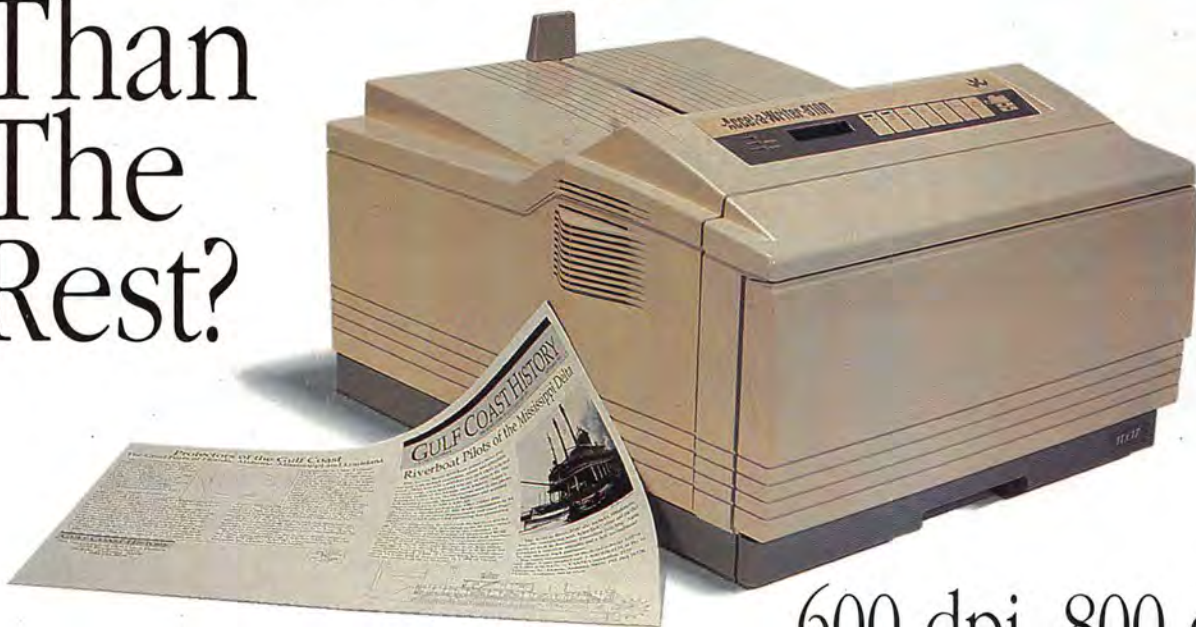
DiskLock

If you optimize a hard disk that contains a security program such as DiskLock, the password on the disk will sometimes be shuffled around and lost. This means that you can no longer access the disk or any of your files.

Because the Mac first looks on the SCSI bus for a hard drive, before it reads from the floppy disk, disaster can strike if it can't read the hard disk. So don't optimize a hard disk with a security program installed — disable the security extension, or remove it entirely before you optimize.

Jonathan Law
Princeton, NJ

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Questions, anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling *Dr. Macintosh*, second edition. Andy Ihnatko is a longtime activist with BCS+Mac. They're both ready to answer your questions about everything Macintosh.



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By Bob LeVitus and
Andy Ihnatko

Explosive PowerBooks?

Q. Although the British are a civilized lot, when it comes to potential terrorism at their airports, they become downright obnoxious. Whenever they find a computer being carried onto an aircraft at Heathrow, they will run it through the X-ray machine, not once but *twice*. Turning on the computer makes no difference to them. What risks am I running every time the computer illiterates at Heathrow zap my PowerBook? I travel there every month and wonder if I am courting disaster by taking my PowerBook with me.

Eric Francis Germain
Gaeta
Italy

Andy: As much as I hate going through security with my hardware, every time I board a plane with my hard drive, I can't help but reflect that they've just let me take a sealed metal box onto the plane and all they wanted me to do to prove it wasn't a bomb was plug

it in and see if a little light came on.

Anyway, there's a bunch of things you can do whenever you travel with a Mac. First, make a complete backup of all your drives. Second, phone the airline to check its security policy regarding electronic equipment. The security staff at just about every airport in America will let you bypass a scanner if you can prove that your laptop or hard drive actually functions, but in the case of international carriers, it always helps to know the policy beforehand. Third, always carry a Swiss-army knife. They're fun, and they can be used to take the lid off a hard drive in a pinch, if that's the only way the security dude will let you swan past the scanner. Always know how to strip your hardware — that's good advice.

Lastly (and expensively), consider buying one of those newfangled 3.5-inch optical-cartridge drives. They work just like Bernoulli or SyQuest drives do, only the cartridges are immune to the magnetic nastiness that issues forth from security scanners. You can put a cartridge up on the refrigerator with a magnet for a week, and your data will still

* ... But Were Afraid to Ask

Look, I don't mean to be rude or anything, but this month I want to ask a simple question: *Why* is it that just because some fathead comes up behind me while I'm on a highway and flashes his lights, I'm supposed to get out of *his* way? You want to pass? Then *pass* me! Just don't expect *me* to risk *my* life making lane changes at 80 miles an hour just so *you* can stomp on the accelerator and sail on past!

OK, thanks for letting me get that off my chest. Anyway, if you have any similarly simple questions about this acme of human achievement we affectionately call the Macintosh (or, if you're on my side on this whole flashing-lights business), drop us a line. To protect you from boneheads in the high-speed lane, we'll say that your question was sent in by the Democratic Whip of the United States Senate in 2032.

Q. When I finally got around to reading my PowerBook manual, I was a little concerned about where it says that only "low-power" ADB devices should be used with a PowerBook. First, what exactly is a low-power device (as if I couldn't guess), and will I damage either my PowerBook or the devices if I use the wrong kind?

I've been using the ADB keyboard from my desktop machine. No problems yet, but I still want to be careful.

Nicholas Spears
Franklin, MA

Andy: There are two rules regarding the cautions found in most hardware manuals:

(1) Only about three of them actually need to be heeded, and (2) you'll find out which three they are when you disregard them and are rewarded with a re-creation of those beloved Warner Brothers' cartoons in which Bugs tied the barrel of Elmer's rifle into a bow and then pulled the trigger. The upshot (no pun intended) being: Always heed warnings about your hardware until you're advised otherwise.

Using the "wrong" sort of ADB device will not, in all likelihood, cause any physical damage to either your PowerBook or your ADB device. (Case in point: I have been using a full-sized keyboard and mouse with my PowerBook 100 for months now with no ill effects.) If you use high-powered gizmos when you're running solely on battery power, though, you run the very real risk of the PowerBook's being unable to maintain the ADB chain. The keyboard and the mouse may go dead at some inelegant point, forcing you to restart.

As you've guessed, a low-power ADB device is a plain old device that doesn't pull as much juice from the Mac as the plain-Jane variety does. High-power ADB devices draw enough current to electrocute a fly, whereas the low-power editions draw only enough to kill a gnat. Most ADB devices on the market are high-power, so if you want the low-power variety, make sure you specify that when you buy (low-power mice from Apple have an "O" marked on the bottom of the mouse).

POWER TOOLS HELP FOLDER

be hunky-dory. As you might guess, this makes them an attractive option for folks who like to just plop everything onto the conveyor belt like a normal human being does.

Some random notes on PowerBooks and air travel: If you're late for your plane and don't think you'll have time to start up and shut down properly, it's almost perfectly safe to start up the PowerBook while you're waiting in line and then, after you've proved you're not carrying 6 pounds of plastique, put that baby into Sleep mode as you dash for the plane, doing a sensible shut down once you've gotten there. The only real danger is that you may damage the hard drive, but because the drive's spun down in Sleep mode, the chances of real damage aren't that great as

long as you don't throw your PowerBook into the plane ahead of you.

Finally, if you're demonstrating the PowerBook at a security checkpoint and one of the Mac's endearing bomb icons shows up, I strongly suggest you refrain from making any smart remarks about explosives, unless you wish to become the airline's personal guest in a small, brightly lit room for a few hours.

Bob: Let me just add that I like to live dangerously. I allow my PowerBook to be run through the X-ray machine every time I travel. Maybe I'm just tempting fate, but in a year of frequent air travel, my PowerBook has yet to suffer any ill effects.

When it comes to my floppy disks, however, I must admit I am far less cavalier. I

always carry them in a separate bag and have them hand-checked by the security guard. Andy conducted an informal test last year that suggested that something in the X-ray machine — some say it's the X rays themselves; others blame the magnets in the conveyor belt's motors — kills floppy disks.

SIMMs Fast to Me

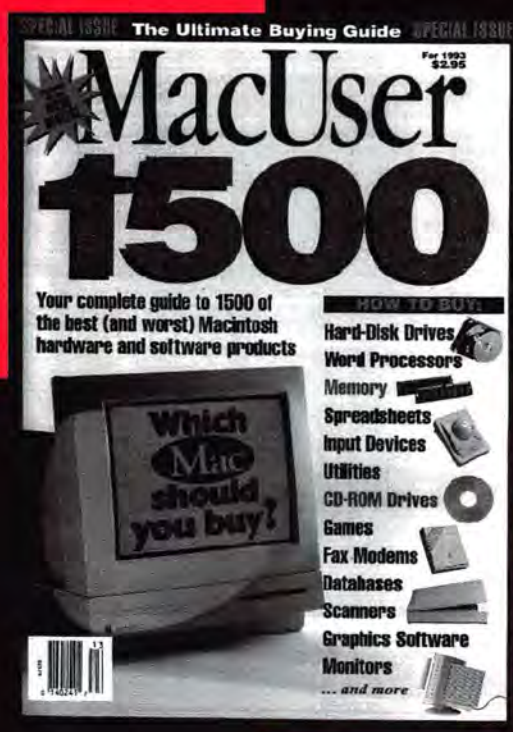
Q. I own a Quadra 700 and have a question regarding SIMMs (single in-line memory modules). I was going to put in some 70-nanosecond SIMMs, but several people I've talked to *insist* that 80-nanosecond SIMMs are the way to go. They say that the Quadra 700's CPU cannot transfer information to the SIMMs at a speed any faster than 80 nanoseconds. Are

70-nanosecond SIMMs going to speed things up at all, or should I consider installing 80-nanosecond chips?

Andy Bachar
Wooddale, IL

Bob: Your "several people" are right — the Quadras (even the Quadra 900 and 950) can transfer data into RAM (random-access memory) only at 80 nanoseconds. Even so, according to Jeff Blackburn, memory-products manager for TechWorks (one of the largest manufacturers of Mac SIMMs), there is no *disadvantage* to installing 70-nanosecond chips and there is currently no price difference. So my advice is to buy 70-nanosecond chips. That way, if a new Mac comes along that can use 70-nanosecond SIMMs, you're all set.

For those of you who are



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lost, SIMMs are the chips you install to add RAM to your Macintosh.

Control Freak

Q. Can you tell me how to generate a character with the Control key on a Macintosh Plus keyboard?

I have given my Plus to my father-in-law to introduce him to the world of personal computers and have also given him an external hard drive. Preparing the hard disk on my Macintosh Classic, I made a password-protected partition, where I put some utilities I don't want him to use accidentally. I used the Control key in the password, but now I cannot find a way to open the partition, because there's no Control key on the Plus' keyboard. Do you know of any way to do this on the

Macintosh Plus keyboard?

Rufus Driessen

Wismar

Germany

Andy: Well, I'm sorely tempted to tell you to hook the drive back up to your Classic, mount the disk, change the password, and then give the drive back to your father-in-law, but I suppose you wanted something more obfuscated. Hmm.

Buy Dad-in-Law a new keyboard with a Control key? This is expensive, but not a bad idea; because the Plus was the last Macintosh to use a non-ADB keyboard and that model's long since been discontinued, it's a dead cert that those keyboards will become more and more difficult to find.

No? OK, then, why don't you try installing PopChar,

that magical freeware control panel that pops a nearly complete character set onto the screen when you hold down the mouse button? All you need to do is mouse on over to the Control key and click on it, and that character will appear wherever the cursor was. Of course, PopChar does not show the nonprintable characters of some fonts, so depending on the font used by the password program, you might be sunk.

If all else fails, you should try loading the similarly niftoid SCSI Probe, a freeware control panel for probing the SCSI chain, and see what happens if you hold your breath and click on the Mount button. Many of the older password-based partitioning programs — and even some of the current ones — had a flaw

that allowed SCSI Probe to mount any and all protected partitions without asking for a password.

Gray Scale on the Cheap

Q. I would like to be able to print the wonderful gray-scale images I create on my LC, but my StyleWriter prints only in stark black-and-white.

Is there a program that will let me print gray scale or that can substitute halftones at the printer's resolution? And while I'm on the subject, what makes the StyleWriter (which I believe is classified as a QuickDraw printer) different from a gray-scale printer?

Paul Nylander

Madison, WI

Bob: Have I got a program for you, Paul. It's called WonderPrint (\$59, from Delta



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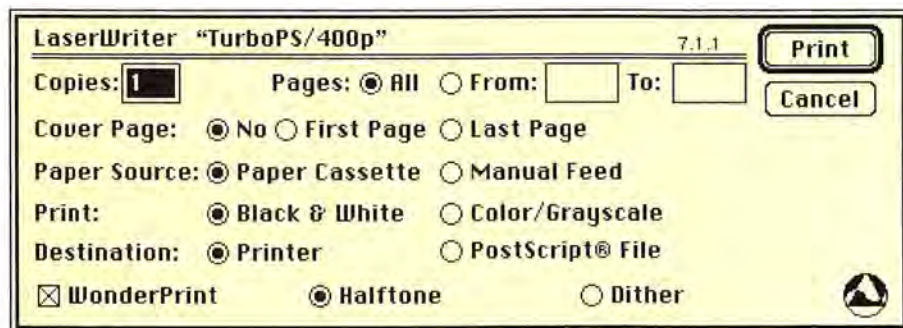


Figure 1: You say you want to print gray scale on your StyleWriter? Delta Tao's nifty utility WonderPrint lets you accomplish this on the fly. Once the program has been installed, gray scale is available when you print from any application.

Tao Software, 760 Harvard Avenue, Sunnyvale, CA 94807; 408-730-9336), and it makes printing images better and faster. Its best feature is that it can add newspaper-quality halftoning to QuickDraw-based printers such as your StyleWriter or a LaserWriter SC or LS. Another benefit is that it speeds up color-image printing on PostScript printers such as the LaserWriter Plus, IINT, and IINTX. It converts color images to gray scale on the fly and does a great job of halftoning them as well.

WonderPrint is an extension. Just drag it into your System Folder and reboot, and it'll be available in the Print dialog box of all your applications (see Figure 1).

Delta Tao is an incredibly cool software company. All of its products are reasonably priced and packaged sensibly. It also provides great technical support. Because it doesn't do any marketing or advertising, you've probably never heard of it, but it's a company worth knowing. Check out WonderPrint. I use it all the time and recommend it without reservation.

As far as your other question is concerned, there's really no such thing as a "gray scale" printer. I think what you mean to ask is, What's the difference between a QuickDraw printer and a PostScript

printer? Aside from the additional chunk of change a PostScript printer will cost you, the quick answer is that a PostScript printer contains "brains" that allow it to understand PostScript, Adobe's device-independent page-description language, which tells printers how to print shapes, letters, and gray-scale images. QuickDraw printers, on the other hand, have no brains and rely on the Macintosh's CPU to process images as QuickDraw, the Mac's built-in graphics language. QuickDraw is optimized for the screen; PostScript is optimized for printouts. That's why QuickDraw printers are slower and less capable than PostScript printers are.

Andy: Lowly, proletarian QuickDraw printers usually tie up your Mac far longer than members of the PostScript bourgeoisie do, but on the other hand, they usually cost a third less than their brainier cousins.

Also, the Mac's native QuickDraw model is going to become much, much studlier and will offer several of PostScript's features (text on a curve, polysplines, better handling of high resolutions, and better gray-scale handling) without PostScript's high licensing fees. But because the new-and-improved version won't be ready for quite some time, you might

find comfort in one or two commercial products. Freedom of Press Light (\$149, from Custom Applications, 900 Technology Park Drive, Building 8, Billerica, MA 01821; 800-873-4367 or 508-667-8585) can give you PostScript emulation on most QuickDraw-based printers, including the StyleWriter. Because it presses your Mac into service translating PostScript instructions into QuickDraw commands, which your printer can more easily deal with, printing with Freedom of Press is much slower, but hey, it's as PostScript as you're going to get without actually buying a PostScript printer.

If all you really need is better gray-scale handling, though, you should pick up a copy of the ever-so-spiffy BetterWriters collection (\$69, from GDT Softworks, 4664 Lougheed Highway, Suite 188, Burnaby, BC V5C 6B7, Canada; 800-663-6222 or 604-291-9121). BetterWriters is a set of printer drivers that replaces the worm-eaten set Apple gives you for its QuickDraw printers. You get a whole wheelbarrowful of extra features: image reduction and enlargement, gray scale, better label handling, the works. It's money well spent if you have a StyleWriter, an HP DeskWriter, or any of Apple's dot-matrix printers.

Warm SCSIs

Q. I'm having some problems with my Quadra 900's SCSI chain that I hope you can help me with. My system hardware setup includes a 420-megabyte internal hard drive, a SyQuest drive, a 50-megabyte external hard drive, a CD-ROM drive, and also a scanner.

First, I keep getting the message "This disk is unreadable. Do you want to initialize it?" Sometimes it points to my SyQuest drive, and other times it points to my CD-ROM drive. However, neither drive ever contains a cartridge or a CD-ROM when the message appears. Besides being annoying, it doesn't seem to affect anything adversely—I click on the Eject button, and everything's fine.

Another problem I have is that in order to get my system to boot, I have to insert a cartridge into the SyQuest drive and a CD-ROM into the CD-ROM drive; however, this is the case only when my scanner is attached. If I disconnect the scanner, I can boot with either or both of the drives empty.

Jim Rogers
Felton, CA

Bob: Before we start, let me give my standard disclaimer: SCSI is a black art. It's voodoo. Nobody knows why some configurations work the way they do on one machine and don't on another. That said, let's look at some possibilities:

First, is your termination set up properly? In theory, only the first device on the chain (the internal drive) and the last one (the scanner) should be terminated. Are they? If not, try out your chain with only the first and the last devices terminated. If so, try adding a pass-through terminator somewhere in the middle of the chain. Although this is not an Apple-sanctioned solution, I've found

that many times it relieves anomalies on the SCSI bus. This is often the deciding factor in whether your SCSI chain works with some devices powered down and may help you avoid having to insert a cartridge or a CD-ROM.

Next, how long are your SCSI cables? The total length of the cables used in your SCSI chain should not exceed 18 feet. If you're even close to 18 feet, try using one or two shorter cables. I just ordered several 18-inch cables, and they were all it took for me to get five devices working with my IIfx at the same time.

Andy: My three rules to SCSI Bliss (beyond the usual Thou Shalt Use Unique ID Numbers and Thou Shalt Not Use Longer Cables Than Thou Must) are, first, always buy the best SCSI cable you can afford. I can't tell you how many times I've tracked the source of my SCSI problems to a pencil-sized, wimpy SCSI cable with inadequate shielding. Second, when in doubt, add a terminator between your Mac and the first item in the chain. It's not supposed to work, but it often does. And finally, you are a fluke of the universe; you have no right to be here; and whether you can hear it or not, the universe is laughing behind your back. Remember that SCSI problems are designed to keep us humble and prepared to accept inevitable defeat with grace and dignity.

As for your problems with powering up the system without anything in the various cartridge drives — you didn't ask, but a nifty utility for such a situation is included as part of FWB's Hard Disk ToolKit and the identically premenclatured Personal Edition. It's an extension that scans for removable drives on startup and ensures that if there are no media in them, driver space will be reserved in memory

anyway. The results are usually that you stop having problems with empty drives at startup and that your media mount automatically when inserted later.

Where's Mike?

Q. In the article "Sound Bytes" (August '92, page 231), you say that the Classic includes a microphone that lets you record sounds. I assume that this refers to a built-in microphone, but I have been unable to locate one on my machine and the reference guides I have do not mention one, although they do mention a "sound generator." What gives?

Shawn Westaway
West Covina, CA

Bob: This one is easy — I goofed. It's the Mac Classic II that includes a microphone. The original Mac Classic has no mike and never had one.

In the strictest sense of the word, none of the Macs except the new PowerBook Duo 210 and 230 actually have a built-in microphone. The Duos are different from all other Macs — you can hold a Duo up to your face and use the built-in mike to record sound as it emerges from your lips.

Most models these days — including the Classic II, LC II, IIsi, IIfx, PowerBooks, and Quadras — include a little plug-it-in-and-mount-it-on-the-front-of-your-monitor microphone that is often referred to as built in. But it's not *really* built in; it's kind of stuck on.

If you own a Classic and want to record sounds, you'll need an external microphone such as the MacRecorder Sound System Pro (Macromedia, 415-442-0200; \$349, including the excellent SoundEdit Pro software), or the VoiceImpact or VoiceImpact Pro (Articulate Systems, 617-935-5656; \$119 and \$299 respectively). ☐

MacUser

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Great Prices. Priceless Support!

SyQuest 5110c—\$699

The New Standard



You know the SyQuest 44 and 88. Together they are the portable storage standard in the Macintosh market. True interchangeability has been the only problem in an otherwise idyllic

transportable storage world. Now SyQuest's 5110c solves the problem. With both read and write compatibility with 44MB and 88MB cartridges*, you no longer have to wonder which SyQuest unit to buy.

Access files on any SyQuest drive

Save files on 44MB or 88MB cartridges, then take them to any compatible SyQuest drive anywhere knowing you'll be able to access them quickly and effortlessly. With the new 5110c drive, that is doubly true. SyQuest's 5110c allows you to read and write to both 44 and 88MB cartridges (*won't format 44MB cartridges)! There's no longer any worry about whether you'll be completely compatible when you get there.

SyQuest's 5110c removes limitations

Use several cartridges for all of your data; distribute cartridges to many different people or to field offices; or lock cartridges away someplace for safe keeping. Never worry about reading and writing to a cartridge just because you don't have the right drive.

SyQuest 5110c drives from APS

The SQ5110c (44/88MB) is based on proven Winchester head and disk technology with hundreds of thousands of units in the field.

The SQ5110c supports average seek times as low as 18ms, which makes editing files direct-to-disk a quick and efficient process.

APS's external enclosure features two outlets, external fusing, push-button SCSI addressing and dual Centronix-style SCSI ports.

SyQuest removable cartridge drives include one cartridge and an external terminator. APS's SyQuest 44 is \$399, the 88 is \$499.

For infinite storage, buy 10 packs

Order SyQuest 44MB cartridges in 10 packs for just \$630 and 88MB cartridges for \$950.

DiskFit Direct by Dantz Development, now ships on every APS hard disk drive and removable media drive product. You get an easy to use, back up

utility to help you protect those precious files and documents. With DiskFit Direct, there's no longer any excuse not to back up.

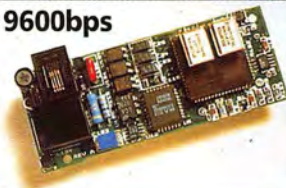
APS Technologies

APSModems: Calling all PowerBooks

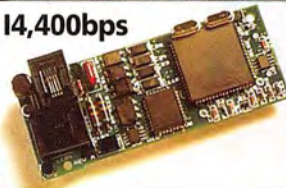


9,600 & 14,400bps
fax/data modems just
\$279 & \$349

9600bps



14,400bps



2400/9600/
4800bps int.
fax modem
\$99*

Pack the power of electronic communication into your PowerBook with an APSModem, fax/data modems for your Powerbook. *For as little as \$99 (regularly \$129) with your purchase of any other

APS PowerBook accessory, outfit your notebook with a 2400 baud Hayes-compatible data modem that sends faxes at up to 9600bps and receives at up to 4800bps. Order one today, fax with it tomorrow.

Have modem, will travel

Your PowerBook will be your most efficient communications tool on the road or anywhere once you've installed an APSModem in your PowerBook. With one of these modems on board, you can send and receive faxes or data from anywhere in the world. Use a hotel fax machine as your remote printer to send yourself hard copies of documents you've written while traveling.

For each, the right modem

The APSModem series starts with a 2400 baud model, which sends data at 2400bps or faxes at 9600bps (4800bps receive). When you buy any APS Power Book accessory—from a GO•80 drive to a PowerBook screw-driver toolkit—you're eligible to purchase this modem for just \$99!

Need more speed and efficiency? Consider the 9600bps or the 14.4kbps models, priced at \$279 and \$349 respectively.

So sophisticated they wake your PowerBook from sleep to receive a fax, then lull it back into slumber—each of APS's internal PowerBook Modems come complete with easy-to-use fax software that supports background faxing and a special QuickFax desk accessory.

Guaranteed quality

You get our easy-to-follow installation instructions, a comprehensive operation manual and APS's legendary service and toll-free technical support. These premium-brand fax modems carry a one-year manufacturer's warranty and APS's 30-day, no-questions-asked money-back guarantee.

Helpful,
knowledgeable
sales
associates

Toll-free
technical
support

30-day
money-back
guarantee

Disk-for-disk
replacement
warranty

24-hour
BBS with
our latest
software

30-day money-back guarantee: All drive products carry a 30-day money-back guarantee. Your risk in the transaction is the cost of shipping.
*Disk-for-disk replacement warranty: SyQuest, most Quantum, Maxtor and DAT drives are warranted for two years. Maxtor 12, 17GB, Fujitsu and Micropolis drives are warranted for five years. Quantum 25 drives, TEAC drives, all CD-ROM drives, Epson MOs and SyQuest cartridges are warranted for one year. Toshiba drives are warranted for three years.

*Prices and specifications subject to change without notice.
All hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh. All hard drives come preformatted with Apple's System 7.0.1 software, at least 9.2 MB of compacted publicly-distributable software, and APS Technologies' ALLIANCE POWER TOOLS SCSI formatter/hard disk partitioner.
*Toll-free technical support as often or for as long as you need. Regular hours are 8 am to 6 pm Monday thru Friday, 10 am to 4 pm Saturday, Central Time.

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Great Prices. Priceless Support!

Quantum Leap I225S—\$1899



Get Quantum performance, reputation and commitment to quality in a 1GB package with service and support only APS can provide with the new APS/Quantum I225S. Using Quantum's pro-

prietary caching schemes, this 4500 RPM screamer performs equal to or greater than drives with higher spindle speeds. This powerhouse averages seek times of 10ms and transfer rates approaching 3MB per sec.

Quantum

MB	INTL	EXTL
240	\$589	\$659
425	929	999
525	1149	1219
1225	1899	1969

Go•Drives

80	\$349	\$499†
120	469	599†

†Battery-Powered portable case for PowerBooks

ELS Drives

42	\$199	\$279
85	259	329
127	329	399
170	369	429

Fujitsu

MB	INTL	EXTL
520	\$1049	\$1149
1.2G	1599	1799
2.0G	2595	2695

Includes Fujitsu's 5-Year Warranty

Toshiba

830	\$1269	\$1339
1.2G	1699	1769

Ask about our \$69 extended-life PowerBook Battery.

Ask about APS software specials



Micropolis

MB	INTL	EXTL
1.2G	\$1999	\$2069
2.0G	2899	2999

Includes Micropolis' 5-Year Warranty

Maxtor

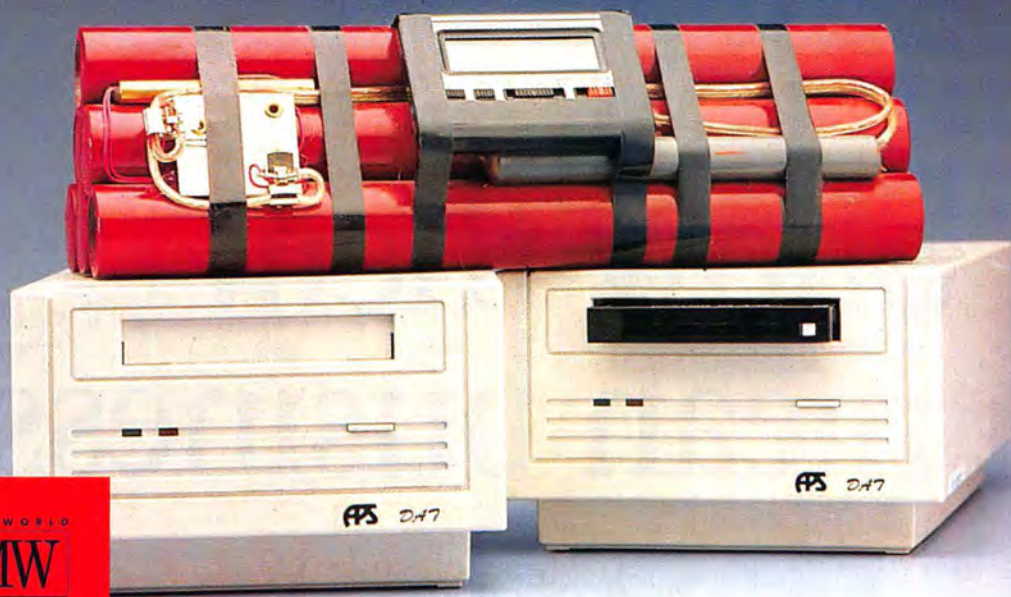
120	\$339	\$419
213	499	569
340	699	769
535	999	1079
1.2G**	1649	1749
1.7G**	1899	1999

**Includes new 5-Year Warranty

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APS Compression DAT \$1599 blows away the competition



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CHOICE

The Macworld Editors' Choice for high-capacity back up, APS's Compression DAT stores up to 5GB per 90m tape cartridge. Need fast, high-capacity back-up? This \$1599 DAT offers one of the

best archiving solutions on the market. Internal models for Quadra 900 and 950 are just \$1499. Only need to squeeze 1.2 to 2GB onto a cartridge? Take a look at APS's non-compression DAT, now just \$1299.

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24-hour
BBS with
our latest
software

SyQuest

Model	EXTL
SQ555	\$399
SQ5110	499
SQ5110c*	699
Dual 44	799
Dual 88	959

*Read/writes 44 and 88MB cartridges but does not format 44MB cartridges

DAT

Model	INTL*	EXTL
APSDAT	\$1499	\$1599
2.6-5 GB Compression DAT		
APSDAT	1199	1299

Desktop & Portable Units
Archive-based Mechanisms
*Quadra 900 and 950

Digital Audio Tapes

Maxell 60-Meter.....	\$12
Maxell 90-Meter.....	16

All tapes drives
include Retrospect
by Dantz Development

Epson

Model	INTL	EXTL
MO	\$1099	\$1199
Magneto Optical Drive		

SOLA

UPS	
450 watt	\$220
600 watt	330

Toshiba

CD-ROM 3301B	\$569
Includes five-disc APS CD Library	

TEAC

155MB Tape Back-up	\$499
600MB Tape Back-up	799

30-day money-back guarantee • All drive products carry a 30-day money-back guarantee. Your risk in the transaction is the cost of shipping.
• Disk-for-disk replacement warranty • SyQuest, most Quantum, Maxtor and DAT drives are warranted for two years. Maxtor L2, 17 GB, Fujitsu and Micropolis drives are warranted for five years. Quantum 25" drives, TEAC drives, all CD-ROM drives, Epson MOs and SyQuest cartridges are warranted for one year. Toshiba drives are warranted for three years.

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• Toll-free technical support as often or for as long as you need. Regular hours are 8 am to 8 pm Monday thru Friday, 10 am to 4 pm Saturday, Central Time.

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CIRCLE 146 ON READER SERVICE CARD.

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Production Department to Fill Order

Order In Stock?

Yes

Ship Order with Print Copy of Picking Slip on Packing List and Relevant Test Reports

Green and Orange copies of Picking Slip

Send Sales Journal to Headquarters via Modem for Invoicing Customer

Accounting Department Generates Invoice

Collate Picking Slips, Test Reports, and Handwritten Forms

Custom Work Order Procedures

Draft & Process Custom Mail Order

White Copy & Test Reports

Other 2 Copies

Order In Stock?

No

Ship Order with Print Copy of Picking Slip on Packing List and Relevant Test Reports

Green and Orange copies of Picking Slip

Send Sales Journal to Headquarters via Modem for Invoicing Customer

Accounting Department Generates Invoice

Collate Picking Slips, Test Reports, and Handwritten Forms

Custom Work Order Procedures

Draft & Process Custom Mail Order

White Copy & Test Reports

WIDE BODY

Detail Design	Group
Structures	ST1
Systems	SY1
Software	SW1
Support Eqp	SE1
Integration	
Static Test	ST2
Fatigue Test	FT2
Flight Test	FL1
Labor	
Actual	4.3
Plan	3.1
Budget (K\$)	2.1
Actual	1.3
Planned	11
Actual	14

7/19/92 WL

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Now Available: Open,
View, & Print MacFlow
Files in Windows!

Show them you mean business.

MacFlow 3.7 Flowchart Design and Development

Lay it all out for them—the process, the procedures, the relationships. Business works best when everything is clear, and there is no better way to make things clear than a detailed flowchart.

The best way to create flowcharts is MacFlow—the highest-rated flowcharting program. Neither drawing programs nor pencil and paper can create flowcharts as easily as MacFlow. And no program is simpler to learn or use. Graphically organize complex processes, projects, and structures—minutes after opening the package.

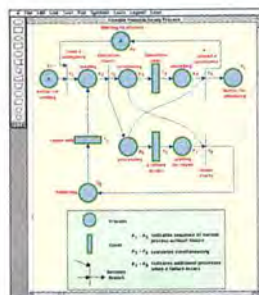
Simply drag pre-drawn symbols onto a page and connect with curved or straight lines. Place text in symbols and on lines, as well as in freestanding notes. Change the chart as desired; lines stretch and stay attached to symbols. Even create stand-alone flowcharts that can be freely distributed to any Macintosh user (and any Windows user with WinFlow Viewer). MacFlow is also System 7-savvy, letting you publish your charts and subscribe to text. Translate to and from text in ASCII and RTF formats as well as outlines created in Acta 7 and MORE.

MacFlow actually enhances your thought process because the interface is so simple and intuitive, nothing stands between your ideas and a presentation-quality flowchart. In fact, you'll find just creating flowcharts keeps your thoughts organized and helps you get a handle on any task.

Show them you're serious—
get MacFlow today.



MacUser Magazine July '91



MacSchedule 3.0 Project Planning and Tracking

Lay it all out for them—the plan, the people, the cost. Give them a path to follow and a way to track progress. Successful projects need a roadmap, and nothing can beat a simple yet comprehensive project schedule.

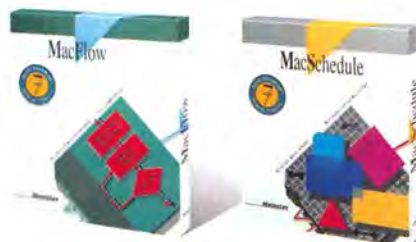
The best way to create quick, presentation-quality project schedules is MacSchedule. The Gantt-chart interface lets you create schedules, with integrated financial data, minutes after you open the application—unlike complex project management software. And MacSchedule is as easy to learn as it is to use.

MacSchedule automatically creates and manages a project calendar. Just enter task names, then indicate timing with a click and drag of the mouse. Status tracking is also easy—just click on a task bar to show progress.

MacSchedule helps track a project from initial estimates to current status by automatically developing calendarized cost estimates and reporting cost and schedule variances in an Earned Value summary. MacSchedule is also System 7-savvy, letting you publish your schedules and data as well as subscribe to data from other programs. Place schedules in documents for proposals and reports or print schedules as slides, overheads, or wallcharts.

With MacSchedule's graphic feedback, you can tell at a glance where your project is and where it's headed. It's the perfect tool for any manager.

Show them your plans for success—
get MacSchedule today.



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phone, write, or fax Mainstay today.

Mainstay

MacFlow, MacSchedule and other Mainstay products are available through retail and mail-order outlets worldwide. Ask for them at: MacConnection, Mac Zone, Mac's Place, MacWarehouse, CompUSA, Egghead, and other fine retailers and mail-order resellers. In Europe, Mainstay products are available at authorized Apple resellers. WinFlow Viewer is only available direct from Mainstay.

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71 rue des Atrébates, B-1040, Brussels, Belgium 322/733.97.91 322/732.32.46 fax

CIRCLE 76 ON READER SERVICE CARD.

This Month on ZiffNet/Mac

ZMAC UTILITY

You can buy commercial programs that let you display pictures or custom patterns on your desktop, but until now there's been no shareware program that works under both System 6 and System 7. *MacUser's BackSplash* changes all that by letting you place any PICT — whether it's a scanned photo or an image created in a graphics program — on your desktop. *BackSplash* is an extension (or INIT, in System 6) you install in your System Folder along with as many as ten PICTs. When you boot, just hold down the correct number key to load that image. *BackSplash* works with monitors of any size. It also senses the number of colors, or the bit depth, an image needs and can automatically change it without making you reboot.

BackSplash was programmed by the Ann Arbor, Michigan-based developer Michael Throckmorton, author of the *MacUser* utilities *Serial of Champions* and *HideAlways*. It is available exclusively on ZiffNet/Mac and, under the membership fee, is available free for one month. Until January 25, 1993, type GO ZMC:POWERTOOLS. After that, find the file BACKSP.CPT in the Download & Support Forum (GO ZMC:DOWNTECH).

By Ben Templin

Taxing Problems

With the inevitable income-tax season drawing ever closer, *MacUser* has arranged a special on-line conference about tax-preparation software. The event will include sneak previews of *MacUser's* upcoming reviews of the latest versions of ChipSoft's *MacInTax* and MECA's *TaxCut*. Product managers and tax experts from ChipSoft will be available to answer special questions. The conference will be held in the ZiffNet/Mac Executives On-line Forum (GO ZMC:EXEC) January 25 to 29. Log on, and join the conversation to find out from the experts about software solutions to taxing problems.

Free (and Nearly Free) Files

Sysop Gregory Wasson presents a sampling of files recently uploaded to ZiffNet/Mac's Download & Support Forum (GO ZMC:DOWNTECH). The CompuServe filename and library name are in parentheses.

ARAClient (ARACLI.SEA, Library 3) is a control panel that adds features to the ARA (AppleTalk Remote Access) application. This utility is a one-step connection scheme that promises to let users forget all the details of network telecommunications. Requires System 7 and ARA. Shareware, \$20. 68K.

Before Dark (BEDARK.CPT, Library 1) installs *ppat* (PixelPattern) resources for your desktop background. The interface is elegant in both use and aesthetics. *Before Dark* is similar to *Wallpaper*, but it lacks a pattern editor and other advanced features of that commercial desktop-background program. *Before Dark* includes 30 high-quality patterns and is System 7-compatible. Shareware, \$10. 70K.

DarkSide (DARKSI.CPT, Library 1) is an application (not an extension) that serves as a screen saver and requires only 64K of RAM to run. Very nicely executed, *DarkSide* has many built-in modules, including fireworks, a moiré pattern, and a playful kitten. Includes support for fade-now and fade-never corners. Requires System 7. Freeware. 372K.

SpeedyFinder (SFINDE.CPT, Library 3) is a control panel that speeds up various aspects of the Finder, including copying. It turns


off window zooming, adds color to floppy-disk icons, lets you rebuild the desktop without restarting, adds keyboard command equivalents to the Finder, links documents, and does much more. Requires System 7. Shareware, \$20 (Australian). 60K.

Stapler (STAPLE.SEA, Library 1) is an application that creates documents similar to System 7's aliases, except that each *Stapler* document can contain references to multiple files, folders, and applications. Opening a *Stapler* document opens all the files "stapled together" in that document. The files can be located in separate folders, on separate disks, and even on separate floppy disks and AppleShare servers. Requires System 7. Shareware, \$10. 120K.

Tell-Me (TELLME.CPT, Library 1) is a notepad application whose purpose is to create short, Post-it-type notes quickly and easily. You can save the most current state of your notes, so if you have three notes on-screen, those notes will open in the same locations the next time you use *Tell-Me*. With a microphone-equipped Mac, you can dictate your notes instead of typing them. Requires *MultiFinder* or System 7 (recommended). Incompatible with *Quadrax*. Shareware, \$5. 26K.

Trainzset (TRAINZ.SEA, Library 1) is a collection of three construction sets — *Trainzset*, *Trams*, and *Trainzset II* — that let you create model-railroad layouts on-screen. You can place buildings, trains, and more. Shareware, \$30. 380K.

WordPerfect Tips, Questions & Answers (WPTIPS.TXT, Library 7) is a text file from *WordPerfect* that contains tips and common questions (with answers) about *WordPerfect*. Freeware. 18K.

Zorba (ZORBA.CPT, Library 1) is a quick-and-dirty security program. It prevents unauthorized people from using a Mac by demanding a password at startup. If the correct password is not entered after three attempts, the program will attempt to shut down the Mac. *Zorba* does not provide heavy-duty security, but it is a good deterrent and keeps an activity log. Read the documentation to get the default password before you launch the program. System 7-compatible. Freeware. 28K. 

Create Your Own Multimedia Productions And 3-D Renderings!

MacRecorder Sound System Pro. Turns your Mac into a complete audio workshop! Record, edit and play back live or recorded sound to add enormous impact to multimedia presentations, training materials and documents with voices, music and sound effects. Nothing smacks an audience like great sound — it keeps them right there!

The MacRecorder Sound System Pro digitizer features a built-in microphone, external microphone jack, line input jack and input level control. Just plug the digitizer into your Mac's printer or modem port, open the mic and start recording! The software included, called SoundEdit Pro, acts as your mixing board to create soundtracks, voice-over narrations and great sound effects. The sound appears on your screen as a waveform for easy editing. Cut and paste sound clips (just like cutting and pasting text) and modify sounds with a host of creative tools to create intriguing effects. Mix multiple tracks of music, sound effects, and voices to produce pro-quality, multi-track soundtracks for your presentations, interactive applications and more.

Magic — Multimedia Made Easy! Magic is appropriately named. Creating pro-quality multimedia productions is almost automatic! Create objects with MacDraw-like simplicity,

make them move along paths that you draw in seconds — lines, curves, circles and rectangles. Click and drag to change paths for custom movement. Great for animated bar, line and area charts and procedure flows. When you want to see what the animation looks like, just click "play." And Magic enables you to create run-time versions of your productions to distribute to others, along with a 2-disk ClipMedia sampler that includes music, backgrounds and animations.

NEW! DIRECTOR 3.1! Macromedia has packed a host of great new features into version 3.1, including enhancements to importing, interactive playback and exporting of QuickTime movies. Version 3.1 runs swifter than before, thanks to a new version of MacroMind Accelerator included FREE — formerly sold separately for \$195. MacroMind Accelerator also smooths out animations. There's also an expanded Object Sensitive Help System.

With QuickTime, Director 3.1 really explodes with opportunities. New features enable you to easily integrate QuickTime movies into interactive MacroMind Director productions — edit, playback and export QuickTime movies from Director files without any additional hardware, and import QuickTime movies as cast members!

Swivel 3D Professional 2.0. Swivel 3D Professional 2.0 is superbly designed, with an interface that enables you to move with blistering speed. Build amazing 3-D scenes with uncanny realism and almost effortless object handling. In fact, NASA relies on Swivel 3D Professional for scientific visualization, concept modeling and idea development. For print applications, Swivel 3D Professional exports Adobe Illustrator format, so views of models can be edited directly in Illustrator. Joe Lettola of TIME Magazine uses this method to create many of his infographics.

Rendering and output capabilities include fast, incredibly smooth shading, 24-bit color output capability, 24-bit image mapping, 8 independent light sources, environmental mapping, spectacular highlighting, RenderMan RIB output and AutoCAD DXF output.

ModelShop II. Why not present your spatial design ideas in



amazing 3-D! Architects and designers are pouring it on with this amazing sketch and rendering tool that produces realistic models with incredible speed, pinpoint-precision and remarkable flexibility. Even the most complex models can be constructed using ModelShop II's 2-D

and 3-D objects (including cuboids, cylinders, walls, arcs, polygons and more). Light and shadows are completely at your command: adjust intensity, color and add an unlimited number of point and spotlights. Drawing and re-drawing is faster with ModelShop II's Layering.

ModelShop II includes an extensive library of elements (including many city locations) that can be added to your models in a snap.

Life Forms. Create sophisticated human motion animations with this new, easy-to-use package. Access shape libraries of figures in sitting, standing, jumping, sports and dance poses, and more. Life Forms automatically creates smooth human motion between any two positions you define. Add natural human motion to Swivel 3D, MacroMind Three-D and Director productions. Save motion sequences as QuickTime movies.



Incredible colors, unbelievable resolution and striking output. This example uses stylized and rendered type as part of the design. Images so lifelike, they are real — amazing capabilities.

MACROMEDIA	
BDG2559 MacRecorder Pro	\$249.95
BDG2560 Magic	\$279.95
BDG2561 Director 3.1	\$749.95
BDG2554 SwivelMan (With MacRenderMan)	\$625.95
BDG2555 ModelShop II	\$625.95
BDG2556 LifeForms	\$359.95

If Picasso, M.C. Escher And Ansel Adams Wrote A Software Program Together...

The all-new Aldus SuperPaint — Version 3.5 — combines superior, easy-to-use painting, drawing and image processing into one complete package. You can use it to create stunning business graphics, fabulous designs and unforgettable color images — without working in separate programs. And believe it or not, you can access 16.8 million colors without 24-bit hardware!

This is another Aldus award winner, enabling designers and businesspeople to communicate ideas with a palette of advanced tools and powerful functions. Combine the spontaneous expression of painting with the precise accuracy of drawing to create spectacular office forms, reports, presentations, brochures, illustrations and even the most complex charts. SuperPaint enables you to



brehtaking works of electronic art.

Of particular note is SuperPaint's ability to include high-resolution text in the draw layer (previously only a designer's dream), the ability to create beautiful gradients — blending up to 256 colors! Also allows you to import/export TIFF and EPS images — even scan images directly into the program (images can be of any size, even with limited RAM; SuperPaint works with large images in virtual mode). SuperPaint is the ideal tool for creating images for presentations and on-screen demos. Complex charts leap to life with stunning color, scaling and transformations.

SUPERPAINT VERSION 3.5

BDG2604 Aldus SuperPaint
New Version 3.5\$133.90



scan your sketches and then enhance them — or work from start to finish on-screen. Turn images into textures, mask and/or fill selected areas, and turn ordinary images into

THE BILLION-COLOR SCANNER!

When the UMAX scanners arrived here at Tiger, their reputation had preceded them. We knew that top designers, architects, artists, pre-press production houses and commercial printers had UMAX flatbeds. A few of us had even seen a UMAX in action. What surprised us was the prices. This low!!

After plugging in the awesome UMAX UC1200S, and scanning a couple of magazine covers, glossy posters, a snapshot of somebody's baby, a 35mm slide of my trip to The Bahamas and our color matching chart — we knew why so many pros use the UMAX. They deliver one-pass, reproduction-quality scans at 1200 dpi! Drenched colors, razor-sharp detail. But the price... How can a product with such a reputation carry such a modest price tag?

UMAX scanners come in a variety of flavors, from a compact, 600 dpi speedster to the top of the line, 1200 dpi hellcat that delivers blistering color scans — it recognizes a billion colors! Rivals the legendary drum scanning technology — at hundreds of thousands less!

Color, black & white, grayscale, halftone



Scan slides with an optional transparency adapter.

— do it all with the amazing UMAX flatbed scanners. For office use, the UMAX black & white scanners pump out 600 dpi images. Feature for feature, nothing outclasses or outperforms UMAX's advanced technology. Great for OCR, handsome desktop design.

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Extraordinary photo-retouching, image editing, and color painting software. Adobe Photoshop excels as an art production tool.

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Do you want to be successful? Do you want to handle your clients and prospective clients like a pro? Do you want to keep right in step and be ready when opportunity calls — and never miss a deadline?

ACT! is the best-selling contact management software (fully System 7 compatible) that puts you squarely in control of clients, vendors, friends and associates. That's what the pros demand. ACT! includes a Contact Manager, Activity Scheduler, Word Processor, Report Generator, To-Do List Manager and Auto Dialer — all rolled into one very sleek, very fast and very easy to use program.

Let's get specific. First, ACT!'s Contact Manager is dBASE compatible, so you can use existing information with no problem at all. Each record contains 70 customizable fields and you'll quickly schedule an unlimited number of calls, meetings and to-dos (without typing), and be reminded even if

you're in another program.

Need to re-schedule? It happens all the time, but with ACT!, you can just drag-and-drop the activity to a new time slot. Prioritize and filter activities with a click. Then, crank out handsome correspondence with the ACT! WYSIWYG word processor. You'll love the pre-designed templates for pro-style letters, memos, fax covers and more. In fact, ACT! can create a letter for you — and you don't even have to type! It includes a Houghton-Mifflin spell checker, easy-to-use mail-merge and a slew of other powerful features.

• Unlimited number of contacts and databases • User-selectable screen layouts, etc.

"ACT! is the best software I've seen for managing contacts and activities. If you are dealing with people in your day-to-day activities, you need ACT! ACT! is easy to use and has the power and flexibility to help me take control of my business day."

—Russell Cooper, Federal Express

ACT!

BDG2764A ACT! for the Mac Competitive Upgrade \$99.00
BDG2764 ACT! for the Mac \$249.00



New! STAR TREK; The Screen Saver! From The Makers Of After Dark.

Here it is, Star Trek fans! A screen saver that pumps out stunning images right from the TV series: Captain Kirk, The Enterprise, crewmembers and those fabulous Tribbles, from that unforgettable episode. Prevent burn-in with new Star Trek: The Screen Saver.

Features • Over 15 incredible Star Trek displays, • Runs all After Dark displays, and • Screen-locking security system.

We've also got **After Dark**, the Ultimate Screen Saver Collection. Over 30 displays including Flying Toasters and Fish! With sound, password protection, logo and message displays, MultiModule and SystemIQ performance maximizer Plus, **More After Dark** — Over 25 incredible new displays for After Dark. Features contest winners Mowin' Man, Tunnel, GraphStat, and beautiful new fish! Boris the Kitten and Lunatic Fringe game module help save your screen from phosphor burn-in. (Requires After Dark software.)



AFTER DARK AND MORE AFTER DARK....



BERKELEY SYSTEMS

BDG2608 Star Trek Mac \$37.95
BDG2609 After Dark \$29.95
BDG2610 After Dark & More After Dark \$33.00

Run MS-DOS Software On Your MAC!

At last! The great barrier between Mac and DOS compatibility has been removed — for good. As users of both Mac and DOS computers, we know the pros and cons. Macs are friendly and advanced, but the DOS world has more people creating more specialized software. Plus, today's office environment uses a mix of DOS and Mac computers. This plays havoc with spreadsheet and data files which need to flow smoothly between Mac and DOS PCs. That's why Tiger is proud to offer the world's best-selling answer from Insignia Solutions. They're the best. They have a solution to fit every need and every Mac. And best of all — it's software only! No expensive hardware to buy or install.

Turn any Mac into a DOS PC. Run actual DOS applications: 1-2-3, ProComm Plus, dBase — virtually any DOS application — from inside a Mac window. Cut & Paste between Mac and DOS windows. Save, copy and print right from your DOS application. Run your favorite DOS application just like it was running on any DOS 286 PC. You can have the best of both worlds: the fast, easy Mac interface you've come to know, and a huge world of specialized DOS software that fits every known need.

Run a DOS program and print directly to any PC printer or Mac printer — just like it was an industry-standard Epson LQ2500 (which virtually all DOS programs support). Or if the DOS program supports Postscript printers, you can print directly to any LaserWriter or other Mac PostScript printer. TrueType fonts are even included for the Epson LQ2500 so you get crisp, clean printouts every time.

There are three members of the SoftPC family, each designed to take advantage of the wide range of different Macs:

Entry Level SoftPC. This member of the SoftPC family was designed for low-cost Macs including the Mac Plus, SE, Classic and Powerbook 100. Recommended for Textual based DOS programs. You get everything mentioned above including IBM

AT 286 emulation, DOS 3.3 and CGA graphics.

Universal SoftPC. Step up to Universal SoftPC and you add several new capabilities to the Entry Level SoftPC package. Universal SoftPC runs on any Mac. CD-ROM support lets your Mac CD reader play DOS CDs. Recommended for Textual based DOS programs.

SoftAT. Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high-performance. You need a Mac LC, SE30, Mac II, si, ci, cx, fx, Quadra or Powerbook 140 or 170 to run it, but it's all speed. You get lightning-fast benefits like a Math Co-processor, EGA graphics for more demanding graphics applications, and Expanded memory for big, hungry applications. SoftAT is the ultimate answer to Mac and DOS compatibility.

SoftNode. Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell Network PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off-the-shelf and customized MS-DOS programs on any Mac.

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Read DOS Disks, Floppies and Externals!

Here's a solution that solves forever the problem of Mac & DOS incompatibility. Need to use a co-worker's DOS floppy with their DOS 1-2-3 file on your Mac? No problem. Simply slip it in and watch as that DOS floppy appears just like any Mac floppy — complete with icons and folders. Amazing! But that's not all. Double-click on that DOS 1-2-3 file and stare in amazement as 1-2-3 Mac or Excel starts up automatically and loads that DOS file! You can make changes, save it, give it back to your DOS-using co-worker, and then chuckle as he loads the file with your changes.

Slip any DOS floppy into your Mac and it looks just like a Mac floppy! An icon appears, you double-click it and DOS files and sub-directories appear just like the were Mac files and folders. Double-click on the DOS files and immediately run Mac applications like Word, 1-2-3 Mac and Excel. AccessPC is still the fastest — fully 4 to 10 times faster than the competition!

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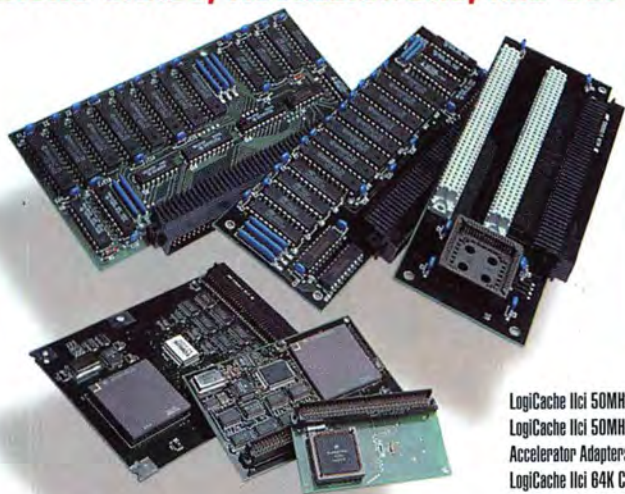
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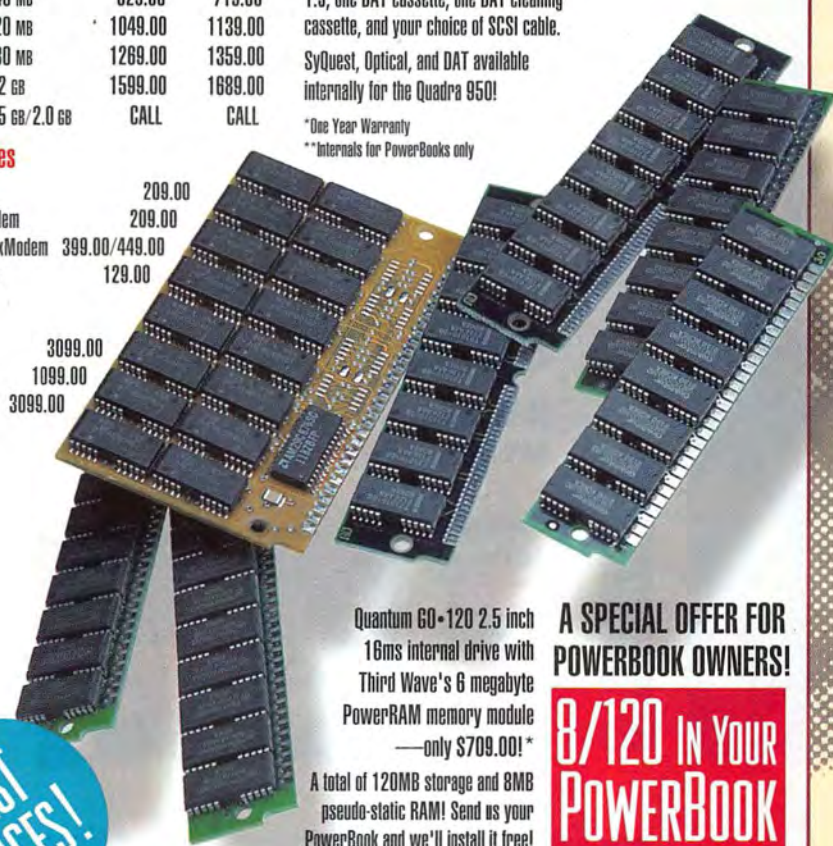
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Pronunciation Tutor-Spanish	33
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Leisure Suit Larry V	44

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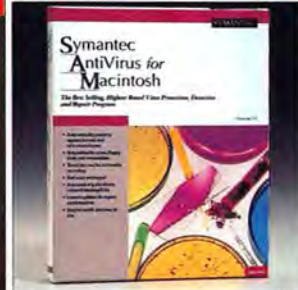
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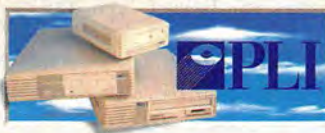


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MacUser Eddy Award-Winning Digital Painting Software Special price with purchase of Wacom tablet	
CORDLESS STANDARD STYLUS	\$59
FIRM CORDLESS PRESSURE-SENSITIVE STYLUS	\$99
SOFT CORDLESS PRESSURE-SENSITIVE STYLUS	\$99

UNIVERSAL POWERCACHE	
ALL DAYSTAR POWER CACHES INCLUDE ADAPTOR Choose any Daystar model:	
33MHz POWERCACHE	\$579
33MHz POWERCACHE WITH 68882 FPU	\$709
40MHz POWERCACHE	\$775
40MHz POWERCACHE WITH 68882 FPU	\$935
50MHz POWERCACHE	\$1099
50MHz POWERCACHE WITH 68882 FPU	\$1279
FASTCACHE II Si 64K	\$265
64K Static RAM cache for IISI	
FASTCACHE II Ci 64K	\$195
64K Static RAM cache for ICI	
FASTCACHE QUADRA 128K	\$375
128K Static RAM cache for Quadra	
DUALPORT IISI	\$169
PDS adapter adds math chip, IISI PDS and cache connector	
COMBOCACHE IISI	\$219
32K Static RAM cache with two PDS & optional math chip	



VIDEOPIGOT / PRO.....\$249/\$1075
Quicktime Movies • Single Slot Digital-video frame grabber
Accelerated 24-bit color interface bundled with VideoPigot

THUNDERSTORM / PRO.....\$809/\$2789
Graphics accelerator
Bundles the ThunderStorm with the Thunder/24

SPECTRUM/24 SERIES III.....\$809
Accelerated 24-bit color interface for 21" display

THUNDER/8 / THUNDER/24.....CALL
Thunder/8 - Accelerated 8-bit color interface
Thunder/24 - Accelerated 24-bit color interface

DIGITALFILM.....\$4499
On-line, digital-video editing system

SUPERMATCH 20-T MULTIMODE TRINITRON\$2399
Two-page, 20-inch Trinitron multimode display

SUPERMATCH 17-T TRINITRON.....\$1049
Full-page, 17-inch Trinitron display

SPECTRUM/24 PDQ PLUS.....\$1489
Accelerated 24-bit color interface for 21" display

SPECTRUM/8+24 PDQ.....\$799
Accelerated 24-bit color interface for 13", 16-bit for 17" & 8-bit for 21"

SUPERMATCH 21 TWO-PAGE COLOR.....\$2775
Two-page, 21-inch color display

PLATINUM 20 / 21 TWO-PAGE.....\$899/\$979
Two-page, 20-inch / 21-inch gray-scale display

PAINTBOARD LI.....\$789

Accelerated 24-bit color interface for up to 20" displays

PROCOLOR 32.....\$2995
32-bit True-Color interface

MEDIA TIME.....\$1515
24-bit color interface for 13", with video display/capture

24SX / 24MX / 24MxQ.....\$605/\$1135/\$1135
Accelerated 24-bit color interface for 13" / 16" with Mac II / 21" with Quadra

24STV / 24XLTV.....\$755/\$2548
Accelerated 24-bit color for 13", video display/capture
Accelerated 24-bit color, video display/capture

8XLI / 24XLI.....\$899/\$1699
Accelerated 8-bit color interface, upgradeable to 24-bit
Accelerated 24-bit color interface

COLORBOARD 264/SE30.....\$685
24-bit color interface for 13" display with SE30

CORRECTCOLOR CALIBRATOR.....\$1815
Calibrates displays with interface cards

21" COLOR DISPLAY.....\$2569
Two-page, 21-inch color display

20" MULTI-SCAN TRINITRON.....\$2149
Two-page, 20-inch Trinitron display

20" MULTIMODE HITACHI.....\$1325
Two-page, 20-inch Trinitron display

CORRECTPRINT 300.....\$6899
Dye sublimation printer offers 300 dpi output

INFINITY 88 TURBO EXTERNAL.....\$649

88MB SyQuest removable cartridge drives

INFINITY 40 TURBO EXTERNAL.....\$519
44MB SyQuest removable cartridge drives

INFINITY 128MB 3.5" OPTICAL.....\$1549
Removable, rewritable optical cartridge drive

INFINITY 128MB 3.5" OPTICAL INTERNAL \$1449
Removable, rewritable optical drive, internal for Quadra

INFINITY FLOPTICAL 21MB.....\$339
Stores 21MB on 3.5" floptical diskettes

INFINITY FLOPTICAL 21MB INTERNAL.....\$299
Stores 21MB on 3.5" floptical diskettes, internal for Quadra

PLI 4GB DAT DRIVE.....\$1399
4.0GB DAT back-up drive

QUICK SCSI.....\$319
SCSI-2 NuBus host adapter

PLI MINIARRAY 480.....\$2249
480MB fixed hard drive with QuickSCSI

PLI 850MB MINIARRAY.....\$3599
850MB fixed hard drive with QuickSCSI

PLI 1.0GB MINIARRAY.....\$4099
1.0GB fixed hard drive with QuickSCSI

INFINITY OPTICAL 5.25" 600MB SONY.....\$2769
Removable, rewritable optical cartridge drive

INFINITY MaxOptical 1GB.....\$3299
1.0GB Optical disk drive with 35ms average seek time

SILENTWRITER MODEL 95.....\$1369

Laser printer with 6 ppm, 300 dpi output, 2MB RAM

SILENTWRITER 4MB RAM UPGRADE.....\$269
RAM upgrade for SilentWriter Model 95

SILENTWRITER 2MB RAM UPGRADE.....\$125
RAM upgrade for SilentWriter Model 95

SILENTWRITER MODEL 95 FAX UPGRADE.....\$529
Adds fax capability to SilentWriter Model 95

CDR-37.....\$406
Portable CD-ROM Reader

CDR-74.....\$849
Multimedia portable CD-ROM Reader

MULTISync 3FGX / 4FG.....\$629/\$755
15-inch multifrequency color displays

MULTISync 5FG.....\$1349
17-inch multifrequency color displays

MULTISync 6FG.....\$2375
21-inch multifrequency color displays

MACFG 8X.....\$737
Accelerated 8-bit color interface

MACFG 24X.....\$1549
Accelerated 24-bit color interface

COLORMATE 300 PS40.....\$3999
Color laser printer with 17 PostScript fonts & 4MB RAM

COLORMATE 300 PS80.....CALL
Color laser printer with 35 PostScript fonts & 8MB RAM



MICROSOFT WORD 5.0
\$279

**MACACADEMY VIDEO
TRAINING TAPES**
\$36

ADOBE PHOTOSHOP
\$499

QUARK XPRESS 3.2
\$499

QUARK PASSPORT
INTERNATIONAL LANGUAGE SUPPORT
\$1499

**ACT! CONTACT
MANAGER**
\$232

PRINTERS

APPLE STYLEWRITER.....\$339
APPLE PERSONAL LASERWRITER NTR.....\$1675
APPLE LASERWRITER II / IIG.....\$2199 / \$2775
DATA PRODUCTS 1560 TABLOID.....\$2889
DATA PRODUCTS LZR-960.....\$1599
DATA PRODUCTS LZR-965.....\$2379
DATA PRODUCTS JOLT.....CALL
GCC BLP ELITE.....\$1179
GCC PLP II / IIS.....\$799 / \$1099
GCC WIDE WRITER 360.....\$1449
HEWLETT PACKARD DESKWRITER.....\$375
HEWLETT PACKARD 550C.....\$715
HEWLETT PACKARD LASERJET 4M.....CALL
LASER MASTER MAX WRITER 400.....CALL
NEWGEN PRINTER LINE.....CALL
QMS PS-410 / PS-860.....\$1475 / \$4025
TEKTRONIX COLOR QUICK INKJET.....\$1651
TI MICROLASER PS17 / PS35.....\$1175 / \$1319
TI MICROLASER TURBO.....\$1474

MODEMS & FAXES

DOVEFAX / DOVEFAX PLUS.....\$175 / \$225
HAYES ULTRA 9600/SC II.....\$675
LOGICODE QUICKTEL XEBA 96/96 V.42BIS.....\$386
PRACTICAL PERIPHERALS PM9600SA.....\$455
PROMETHEUS 24/96 / 96/96 S/R FAX.....\$259 / \$599
ZOOM AFX EXTERNAL 96/48 S/R FAX.....\$99

NETWORKING

ASANTE EN/SC SCSI ETHERNET.....\$302
DAYNASTAR MINIHUB 12-PORT.....\$657
FARALLON PHONENET STAR CONNECTOR.....\$849
PHONENET 10-PACK.....\$188
SHIVA ETHERGATE.....\$1265

SCANNERS

HEWLETT PACKARD SCANJET IIC.....\$1299
MICROTEK SCANMAKER II / IIXE.....\$849 / \$1099
MICROTEK 1850 SLIDESCANER.....\$1399
SHARP JX320 / JX450 WITH INTERFACE.....\$999 / \$3999
SHARP TRANSPARENCY ADAPTOR.....\$849
UMAX SCAN OFFICE GRAYSCALE.....\$825
UMAX 630 / WITH TRANSPARENCY.....\$1079 / \$1749
UMAX 840 / WITH TRANSPARENCY.....\$1599 / \$2273
UMAX 1200 / WITH TRANSPARENCY.....\$2889 / \$3539
UMAX TRANSPARENCY ADAPTOR.....\$679
COLOR ENCORE SOFTWARE, WITH SCANNER.....\$149

DISPLAYS

APPLE 12" / 14" RGB DISPLAY.....\$399 / \$545
APPLE 16" RGB PORTRAIT DISPLAY.....\$1199
SEIKO CM-1445.....\$449
SONY CPD-1304S / CPD-1604S.....\$599 / \$1029

ACCELERATORS AND CACHE

AE QUICKSILVER IIS WITH FPU.....\$245

AE TRANSWARP LC 33MHZ WITH FPU.....\$895
DGR TECH MAX LC EXPANSION CHASSIS.....\$349
NEWER TECHNOLOGIES QUADRA OVERDRIVE.....\$119

DRIVES & TAPES

INTERNAL / EXTERNAL KIT.....\$29 / \$99
APPLIED ENGINEERING 1.44 / PLUS.....\$209 / \$283
BERNOULLI PRO 90MB WITH INTERFACE.....\$539
DGR 128REM TURBO 3.5" MO.....\$1299
DGR 256REM 3.5" MO.....\$1699
FUJITSU 520MB.....\$1099
FUJITSU 1.2GB.....\$1489
QUANTUM 127MB ELS.....\$345
QUANTUM PRODRIVE 240MB.....\$599
QUANTUM 425MB.....\$949
ALL SEAGATE DRIVES.....CALL
CD-ROM
CHINON CD-ROM DRIVE.....\$525
EMAC CD-ROM DRIVE.....\$339
TOSHIBA CD-ROM XM 3201A.....\$685
TYPE GALLERY PS.....\$229

SOFTWARE

ADOBE ILLUSTRATOR V.3.2 W/ATM.....\$335
ALDUS FREEHAND V.3.1.....\$369
ALDUS PAGEMAKER V.4.2A.....\$475
ALDUS PERSUASION V.2.1.....\$318
CANVAS V.3.0.....\$239

CLARIS WORKS V.1.0.....\$184
CONNECTIX POWERBOOK UTILITIES.....\$46
DIF DOUBLER V.3.7.....\$39
EFI CACHET.....\$459
FILEMAKER PRO V.2.0.....\$244
FOXBASE +MAC V.2.1.....\$265
FRACTAL DESIGN PAINTER V.1.2.....\$229
MACDRAW PRO V.1.5.....\$249
MACROMIND DIRECTOR V.3.1.....\$849
MICROSOFT EXCEL V.4.0.....\$299
MICROSOFT OFFICE V.2.5.....\$489
MS PROJECT / WORKS.....\$429 / \$159
MINICAD V.4.0.....\$469
NORTON UTILITIES MAC V.2.0.....\$88
OMNIPAGE / OMNIPAGE PRO.....\$449 / \$599
PIXAR TYPESTORY.....\$159
PIXELPAINT PROFESSIONAL V.2.0.....\$385
RETROSPECT V.1.3.....\$131
SNOOPER / WITH NUBUS.....\$99 / \$135
STRATAVISION 3D V.2.5.....\$549
SWIVEL 3D PRO V.2.0.....\$439
TYPESTYLER V.2.0.....\$122
WORDPERFECT V.2.1.....\$265

INPUT/OUTPUT

APPLE EXTENDED KEYBOARD.....\$170
DATADESK 101 KEYBOARD.....\$115
KENSINGTON TURBO MOUSE 4.0.....\$101
KEYTRONIC MACPRO PLUS KEYBOARD.....\$115

FEATURING



SyQuest
REMOVABLE
TECHNOLOGY

ClubMac 44mb	SQ555	Actual MAC Capacity: 42mb	\$398
ClubMac 88mb	SQ5110	Actual MAC Capacity: 84mb	\$498
ClubMac Dual 44mb			\$749
ClubMac Dual 88mb			\$919
ClubMac Dual 44mb & 88mb*			\$889
Internal 44mb for Quadra 900 / 950			\$388
Internal 88mb for Quadra 900 / 950			\$488
44mb Cartridge	(10 pack-\$62 each)		\$64
88mb Cartridge	(10 pack-\$96 each)		\$99

SyQuest Drives include a TWO Year Warranty, one cartridge & necessary cables, SCSI Director™ v.2.4 Formatting Utility. * Includes (1) 44mb & (1) 88mb cartridge • SyQuest Cartridges carry a ONE Year Warranty.

**NOW
AVAILABLE**
SyQuest Drives
for
Quadra 900/950



**New
Pro Drives**

Quantum

Unformatted Capacity	Model	Average Access	Actual MAC Capacity	Internal	External
Go Drives 2.5" Low Profile for PowerBooks					
80mb	GO•80	17ms	80mb	\$329	\$429
120mb	GO•120	17ms	120mb	\$459	\$559
ELS Drives 3.5" Low Profile & Low Power					
42mb	ELS42	19ms	40mb	\$185	\$245
85mb	ELS85	17ms	82mb	\$249	\$309
127mb	ELS127	17ms	124mb	\$329	\$389
170mb	ELS170	17ms	160mb	\$359	\$419
LPS Drives 3.5" Low Profile & High Performance					
240mb	LPS240	10ms	234mb	\$549	\$609
525mb	LPS525	10ms	525mb	\$1089	\$1149
PRO Drives 3.5" High Capacity & Performance					
425mb	PRO425	19ms	406mb	\$899	\$959
700mb	PRO700	10ms	700mb	\$1279	\$1339
1.0GIG	PRO1050	10ms	1.0GIG	\$1569	\$1629
1.2GIG	PRO1225	10ms	1.2GIG	\$1749	\$1809

ELS, LPS, and PRO drives have a TWO Year Warranty. GoDrive have a ONE Year Warranty.

**5 YEAR
WARRANTY**

FUJITSU

Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
425mb	M2623SA	3.5" Half Height	9ms	405mb	\$899	\$1029
520mb	M2624SA	3.5" Half Height	9ms	496mb	\$1029	\$1095
1.2GIG	M2266	5.25" Full Height	14.5ms	1029mb	\$1589	\$1689
2.0GIG	M2652	5.25" Full Height	14.5ms	1.6GIG	\$2585	\$2685

NEW!

CONNER

Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
85mb	CP30080E	3.5" Low Profile	17ms	82 mb	\$239	\$299
120mb	CP30100	3.5" Low Profile	19ms	116 mb	\$319	\$379
170mb	CP30170E	3.5" Low Profile	9ms	160 mb	\$339	\$399
212mb	CP30200	3.5" Low Profile	9ms	206 mb	\$469	\$529
540mb	CP30540	3.5" Low Profile	8.5ms	515 mb	\$1095	\$1155

ClubMac OPTICAL Drives

Model		Capacity	Description	Seek	External
CMO-OD3000	Teac	128mb	3.5" Half Ht	45ms	\$1049
CMO-LF3004	Panasonic	128mb	3.5" Half Ht	45ms	\$1169
CMO-3100E	Ricoh	128mb	3.5" Half Ht	45ms	\$1249
CMO-3051E	Ricoh	594/652mb	5.25" Full Ht	28ms	\$2695
CMO-5030E2	Ricoh	594/652mb	5.25" Full Ht	66.7ms	\$2149
128mb Cartridge			3.5" Single Sided		\$39
594/652mb Cartridge			5.25" - 512/1024 bytes/sec		\$99

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

Maxtor

Price Point
and
Performance



Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
120mb	7120XT	3.5" Low Profile	15ms	121mb	\$315	\$375
207mb	7213	3.5" Low Profile	15ms	202mb	\$475	\$535
330mb	LXT-340	3.5" Half Height	15ms	324mb	\$675	\$735
535mb	LXT-535	3.5" Low Profile	12ms	510mb	\$999	\$1059
645mb	XT-8760S	5.25" Full Height	16.5ms	639mb	\$1229	\$1329
1.2GIG	PO-12S	5.25" Full Height	13ms	997mb	\$1519	\$1619
1.7GIG	PO-17S	5.25" Full Height	13ms	1433mb	\$1759	\$1859

Maxtor 3.5" Drives include a ONE Year Warranty.
Maxtor 5.25" Drives include a TWO Year Warranty.

Seagate

ELITE SERIES



Unformatted Model Capacity	Description			Actual MAC Capacity	Internal	External	
645mb	ST4767N	5.25" Full Ht	W-R II	11.9ms	634mb	\$1529	\$1629
1.2GiG	ST41200N	5.25" Full Ht	W-7	15ms	989mb	\$1579	\$1679
1.6GiG	ST41651N	5.25" Full Ht	W-8	15ms	1350mb	\$1919	\$2019
2.1GiG	ST42100N	5.25" Full Ht	W-9	12.9	1900mb	\$2149	\$2249
1.6GiG	ST41600N	5.25" Full Ht	Elite-1	11.5ms	1307mb	\$2089	\$2189
2.4GiG	ST42400N	5.25" Full Ht	Elite-2	11ms	2050mb	\$2969	\$3069
3.4GiG	ST43400N	5.25" Full Ht	Elite-3	11ms	2750mb	\$4149	\$4249

Seagate Drives include a ONE Year Warranty.

TAPE BACKUP Systems

Bundled with
RetroSpect v.1.3c
Backup Software



Capacity	Model	Description	Media	Internal	External
155mb	Teac MT2ST/N50	Analog	CT600N	\$459	\$489
600mb	Teac MT2ST/F50	Analog	CT600F	\$669	\$699
2.0GIG	ARDAT	DAT, DDS	4mm	\$1219	\$1249
2.0GIG	WangDAT 1300XL	DAT, DDS	4mm	\$1299	\$1329
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm	\$1549	\$1549
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1349	\$1389
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1539	\$1569
2.2GIG	Exabyte EXB-8200	Digital/Helical	8mm	\$1949	\$1949
5.0GIG	Exabyte EXB-8500	Digital/Helical	8mm	\$2999	\$2999

Includes RetroSpect v.1.3c Backup Software, One Tape and ONE Year Warranty

NEW
Lower Prices

DAYSTAR
DIGITAL



PowerCache

(Classic, SE, LC, SE/30, II, IIfx, IIfx, IIfx)

	w/o FPU	w/ FPU	Cache Cards	
16 MHz PowerCache	\$399	\$459	FastCache IIfx	\$279
33 MHz PowerCache	\$539	\$659	FastCache IIfx with 68882	\$349
40 MHz PowerCache	\$749	\$909	FastCache IIfx	\$215
50 MHz PowerCache	\$1079	\$1319	FastCache 040 (Q700/900)	\$259
Equalizer LC	\$169	\$239	FastCache 040 (Q700/900/950)	\$399
PowerCache Adapter	\$40		Expansion Boards-Mac LC & IIfx	
*PowerCache Adapter not included			DualPort IIfx	\$165
			PowerMath LC	\$115
			33MHz Turbo 040	\$Call

ASANTÉ Networking

MACCON+ 64K Thick/Thin or Thick/10BaseT	\$159
MACCON 3 64K Thick/Thin/10BaseT (Most MACs)	\$209
Friendly Net Adapter Thick or Thin or 10BaseT	\$79
EN/SC10T SCSI Ethernet with 10BaseT	\$249
EN/SC10TPB SCSI Ethernet with 10BaseT for PowerBooks	\$309
EN/SC SCSI Ethernet w/ Thick, Thin, 10BaseT	\$349
EN/SCPB SCSI Ethernet w/ Thick, Thin, 10BaseT for PowerBooks	\$285
10THub - 12 port 10BaseT Hub / 8 port 10BaseT	\$499 / \$249
12 Port Smart Hub	\$Call for Pricing and Options

Farallon

EtherMac 16K Thick/10BaseT or Thick/Thin NuBus	\$157
EtherMac 64K Thick/Thin/10BaseT Most Macs	\$206
EtherMac 64K Thick/Thin/10BaseT SE30/IIfx	\$237
10THub Starlet 9 Port	\$249

Macintosh Memory

PowerBook 140/170	Quadra 950	Video (Q700/900)
2MB Memory Module \$Call	16mb Module \$Call	256 VRAM \$Call
4MB Memory Module \$Call	256 VRAM \$Call	Macintosh Memory
6MB Memory Module \$Call	Mac IIfx	1mb X 8 - 80ns \$Call
PowerBook 160/180 \$Call	1mb X 8 - 80ns \$Call	2mb X 8 - 80ns \$Call
Duo 210/230 \$Call	4mb X 8 - 80ns \$Call	4mb X 8 - 80ns \$Call
	16mb X 8 - 80ns \$Call	16mb X 8 - 80ns \$Call

Modems

PSI		
PowerModem (24/96/48 S/R fax modem)	\$135	
PowerModem II (24/96/96 S/R fax modem)	\$235	
PowerModem III / IV	\$339 / \$419	
Global Village (for PowerBooks)		
PowerPort Bronze (24/96 S/R fax modem)	\$195	
PowerPort Silver (96/96 S/R fax modem)	\$365	
PowerPort Gold (14,400 S/R fax modem)	\$429	
TelPort Bronze/Silver/Gold	\$199/349/435	
Supra FAXmodem	\$339	

Scanners

MICROTEK	
ScanMaker II	\$889
ScanMaker IIXE	\$1185

EPSON

ES-600C	\$1139
ES-800C	\$1429
Auto. Doc. Feeder	\$429
Transparency Option	\$739

SUPERMAC

Graphic Displays

SuperMatch 20" Multimode Trinitron	\$2525
SuperMatch 20" Color	\$1515
SuperMatch 17" Trinitron	\$1089
21" Platinum (Black and White)	\$999
Platinum 20 Full-Page	\$929
Digital Video Boards / Acceleration	
Video Spigot (NuBus / IIfx / LC)	\$379/339/255
VideoSpigot Pro (NuBus or IIfx)	\$1095
Spigot and Sound NuBus / Pro	\$489 / 1179
ThunderStorm	\$845

Graphic Cards

Thunder/24	\$2345
Thunder/8	\$1169
Spectrum/24 Series III	\$839
Spectrum/24	\$755
Spectrum/24 Accelerator	\$419
Spectrum/8*24 PDQ	\$829
Spectrum/8 Series III	\$419

Graphic Cards*5 Year Warranty
Graphic Displays*3 Year Warranty

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THE ART & SCIENCE OF COLOR



Color Display Adapters

RasterOps 24XLi	\$1939
PaintBoard 24 / Li	\$1549 / 829
RasterOps 8XLi / 8XL	\$929 / 465
RasterOps 24Mx / MxQ	\$1165
RasterOps 24Sx	\$619
Multimedia	
RasterOps 24XLTV	\$2699
MediaTime	\$1549
RasterOps 24STV	\$779
RasterOps VideoTime	\$1165

Graphic Displays

CorrectColor/20T MultiScan	\$3965
21" Color (2168)	\$2679
20 Multimode Color (2085H)	\$1345
20T MultiScan Trinitron (2075M)	\$2599
21" Mono/Gray Scale (2110)	\$999
15" Mono/GS Portrait (1510)	\$505
ClearVue/SD21 (2570)	\$1399
16" Sweet 16 Color (1649)	\$1165



NEC

Model 95	\$1379
Model 95FX (with FAX)	\$1859
Model 97	\$1749
Model 97FX (with FAX)	\$2199

NEC Silentwriter Model 95 / 97 Features:

- Adobe PostScript Level 2 • 6 ppm (Model 97 • 10 ppm) • 300 dpi • 35 fonts
- 2 MB RAM standard • Auto Interface Monitoring • AppleTalk, Serial & Parallel



MultiSync Monitors

MultiSync 3FGx (15")	\$629
MultiSync 4FG (15" with AccuColor)	\$759
MultiSync 5FG (17" with AccuColor)	\$1315
MultiSync 6FG (21" with AccuColor)	\$2399
Mac FG 8X / 24X Interface	\$659 / \$1235

CD GALLERY

CDR-74 Gallery Bundle	\$799
CDR-74 with Mac Interface	\$599

PC Bundles Available

CDR-74 PC Gallery Bundle	\$799
CDR-74 with PC Interface	\$599

CD EXPRESS

CDR-25 Express Bundle	\$395
PC Bundles Available	
CDR-25 PC Express Bundle	\$395



6 NEW
Gallery
Titles



radius

Increase the processing speed of the Mac II up to 8 times, allowing a Mac II to exceed Quadra performance



Accelerators

Radius Rocket 25i	\$1199
Radius Rocket	\$1599
Radius Rocket 33	\$1999
RocketShare	\$419
SCSI-2 Booster	\$249
Radius Displays	
Color Display/21	\$2979
PrecisionColor/20	\$2385
PrecisionColor/19	\$2089
PrecisionColor Pivot	\$Call
Full Page Display	\$579
Two Page Display/19	\$899
Two Page Display/21E	\$1335

Radius Video Cards
VideoVision

VideoVision	\$1929
PrecisionColor 8 Interface	\$499
PrecisionColor 8X Interface	\$729
PrecisionColor 8XJ Interface	\$495
PrecisionColor 24X Interface	\$1629
PrecisionColor 24XP Interface	\$495
PrecisionColor 24XK Interface	\$829
Color Pivot Interface	\$505
Mono. Pivot Interface	\$249
Two Page Display Interface	\$395
PowerView	\$499

Warranties...

- All items manufactured by ClubMac are returned to ClubMac for warranty repair.
- All other items carry manufacturer's warranty.

Money Back Guarantee...

- All products manufactured by ClubMac carry a 30 day money back guarantee.
- ClubMac extends all other manufacturers' return policies to its customers.
- Non-ClubMac products carry 30 day money back guarantee when specified.

Returns...

- Call for RMA number!
 - Any product that is returned WITHOUT an RMA number will be refused.
- ALL PRODUCT INFORMATION AND PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.

ClubMac

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Booth #3677

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JANUARY 6-9, 1993

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DRIVES INCLUDE CASE
WITH 40 WATT POWER
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SOFTWARE UP TO 35%
FASTER THAN FWB



MAGIC 45R SYQUEST REMOVABLE

"THE MAGIC 45R IS ONE OF BEST SYQUEST
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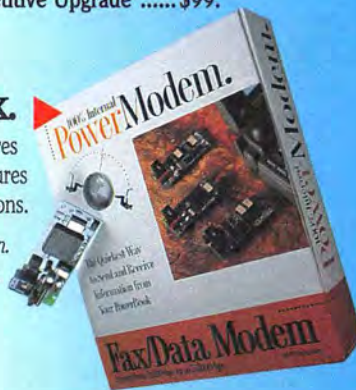
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Save \$200 on **SuperView** when you buy a SuperMatch 17" monitor!* **SuperView** lets you connect your PowerBook 140 or 170 to desktop displays, video projection systems, and standard TV monitors. It supports displays of up to 20 inches with 1024 x 768 resolution and lets you connect to standard TV monitors of all sizes without an external video encoder.

SuperMac •
5579 SuperView\$699.
5599 SuperView w/purchase of SuperMatch 17" monitor\$499.*
4167 SuperMatch 17" monitor\$998.



NEW PRODUCT!

This internal modem receives wake up calls. ▶

The **SupraFAXModem 144PB** gives you 14,400 bps fax and data communications on a card that fits inside your PowerBook. You can even send and receive faxes when your PowerBook is turned off. Wake Up mode turns your PowerBook on when the modem receives a call and, when combined with the included fax software, can send scheduled faxes when rates are lowest.

Supra •
5575 SupraFAXModem 144PB\$298.



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*All offers expire February 28, 1993, unless otherwise indicated.

No one knows Macs like we know Macs.

Apple QuickTime Starter Kit

This kit includes everything you need to get started with QuickTime – the QuickTime INIT, Movie Player, Movie Converter, PICT Compressor, and a CD-ROM full of QuickTime movies you can integrate into your work. It also includes a how-to manual on using QuickTime.

Apple Computer

4608 QuickTime Starter Kit \$158.

Apple Font Pack

This is a carefully chosen selection of 43 TrueType fonts from the world's leading type foundries. They are expertly crafted to provide excellent results – maximum legibility on screen and crisp output on paper. The Apple Font Pack includes new display, text, and symbol faces to give you a wide range of type choices.

Apple Computer

5248 Apple Font Pack \$68.

Macintosh PC Exchange

Now you can conveniently work with PC files from 3.5" or 5.25" DOS and Windows disks on your Mac. Just insert the disk into your Apple SuperDrive or compatible floppy disk drive. Subdirectories on the disk appear as folders, and data files as documents. You can open, change, and save DOS documents just like they were Mac files.

Apple Computer

4609 Macintosh PC Exchange \$69.

System 7.1

The latest System 7 version, System 7.1, installs easily with one click of the mouse. A new font folder for central installation and storage and World Script support for complex character sets such as Japanese are new features. System 7.1 also includes all the fixes now included in the System 7 Tune-Up extension. And for a limited time, you get At Ease free with System 7.1.

Apple Computer

5255 System 7.1/At Ease \$98.

5485 System 7.1 Multipack (10-user) \$388.

At Ease

Put your mind at ease. You choose which applications you'll allow others to access and put them on the At Ease desktop. Then those applications open with a single click and the rest of your hard disk is protected by a password. The At Ease desktop has no trash can, so all your files are safe. It's great for homes with computers and children.

Apple Computer

5247 At Ease \$49.

DateBook/TouchBASE bundle

Get organized with this bundle at a fantastic price. **DateBook** is the ultimate personal time manager. It combines calendar, scheduling, alarms, and To-Do lists to keep track of all your daily activities. And **TouchBASE** keeps all of your personal contacts at your fingertips. Together they form a powerful personal information manager.

After Hours Software

5002 DateBook/TouchBASE Bundle \$98.

Snooper 2.0

New Snooper 2.0, the desktop diagnostic for the Macintosh, performs over 200 tests and benchmarks on all hardware and identifies any problems. This revolutionary software not only saves you time and money, it increases your awareness of what's going on inside your Mac. And for a limited time, Snooper comes with Virex anti-viral software for the Mac, free.

MAXA Corporation

5376 Snooper 2.0 w/Virex \$128.

5377 Snooper 2.0 – NuBus Card w/Virex \$178.

Aldus SuperPaint 3.0

SuperPaint does it all. And at a special low price. It combines painting, drawing, and image enhancement in one powerful, easy-to-use graphics program. With 24-bit color, textures, gradients, and full color TIFF and EPS graphics support, SuperPaint is ideal for anything from the simplest business illustrations to sophisticated full-color art. A six time winner of *Macworld's* "Readers Choice Award!"

Aldus

3545 SuperPaint 3.0 \$98.

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Infini-D 2.0/BackBurner

Infini-D 2.0 is up to 500 percent faster than other rendering programs, can produce broadcast-quality images and animations, and imports and exports QuickTime! It's a great addition for artists using programs like Illustrator, Photoshop, or Premier. And BackBurner does networked background rendering in a fraction of the usual time.

Specular

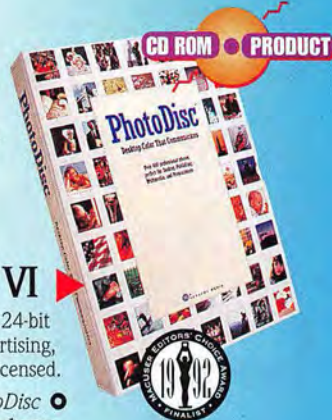
4818 Infini-D 2.0\$648.
5570 BackBurner\$370.
5574 BackBurner 5 Pack Add-on\$928.

PhotoDisc CD Vol. I - VI

Get instant access to hundreds of pixel-perfect photographs! Each image is in spectacular 24-bit color, and shot by top-notch professionals. You're free to use PhotoDisc images in all your advertising, newsletters, and multimedia presentations because they're all model-released and licensed.

PhotoDisc

PhotoDisc CD-ROM Vol. I - VI\$288/per volume.
5522 PhotoDisc MultiMedia Sampler\$37.



VideoFusion

Now the same special effects you've seen in television and film presentations can be created on your Macintosh. VideoFusion lets you add magic to your QuickTime movies, video productions, and presentations. Using standard Mac terminology like "cut," "copy," and "paste," you can apply the latest special effects from VideoFusion's library or create your own. Four stars from MacWEEK!

VideoFusion

5165 VideoFusion\$448.

Morph

Morphing is the popular new special effect you've seen in feature films, music videos, and television commercials. This breakthrough application allows you to smoothly transform two or more images into each other creating QuickTime movies, PICS animations, and still images. Morph is fast, easy to use, and requires no special skills.

Gryphon Software

5513 Morph\$95.



Typestry

This exciting new software creates dimensional text from PostScript Type 1 and TrueType fonts. Typestry uses RenderMan to transform simple words into extraordinary pictures. It accurately simulates metals, woods, or other types of surfaces which can be used to decorate text. Users can also move, rotate, scale, and extrude words.

Pixar

5123 Typestry\$184.
4554 ShowPlace/MacRenderMan 1.1.1 CD-ROM\$318.

Series 1 Photography Filters

Hot new PhotoShop filters! Series 1 Photography Filters are software filters for Photoshop that emulate 35mm camera optical filters. Now you can generate optical effects other than the painterly effects of Aldus Gallery Effects. These filters are perfect for both the graphic artist and the photographer creating ads, brochures, advertising, and video presentations.

Andromeda Software

5161 Series 1 Photography Filters\$79.



Painter 1.2/ArtZ 6"x 8" Tablet bundle

Simulate the tools and textures of natural media with Painter, the remarkable 24-bit color paint program. Create original art or apply natural media effects to other artwork, including scanned images. Used with the ArtZ 6" x 8" Tablet, the effects are astonishing. The latest from the premiere tablet maker, ArtZ's stylus is cordless, batteryless, and detects 120 levels of pressure.

Fractal Design / Wacom Technology

4694/5355 Painter 1.2 / ArtZ 6" x 8" Tablet\$508.

Sketcher 1.0

Create realistic natural-media effects on your Mac with Sketcher, the affordable yet revolutionary program for creating grayscale graphics and retouching images. Sketcher duplicates the effects of traditional tools and textures. Use dozens of brushes, pens, chalks, and even paper grains and image processing tools to apply your artist's touch to the desktop.

Fractal Design

5052 Sketcher 1.0\$98.



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Be a part of the Internet with just your Mac, a modem, and WorldLink. You'll have access to over 15 million people via e-mail, countless files to download, and all the other resources the Internet has to offer. Your first 30 days of access are free; a monthly service charge applies thereafter.

InterCon
5195 WorldLink \$26.

DataPlace Hard Drives

These are the most reliable drives around. Preformatted with the included DP Formatter Plus, they're ready to use right out of the box. And they come with three more free utilities: MacTools 2.0, Stuffit SpaceSaver, and Kaboom! SE. Each also includes manuals, cables, a two- or five-year warranty, and technical support from Mac's Place.

DataPlace
5277 DP+ 42MB Quantum External Drive \$328.
5278 DP+ 85MB Quantum External Drive \$422.

Call for pricing on the complete line of DP+ Drives.

MacIntercomm

The first and only telecommunications program with true multitasking that offers completely invisible file transfers. With a scripting language of unprecedented power, full protocols and terminal emulation, you'll agree that MacIntercomm defines the new standard in telecommunications. Includes a SmartDial feature for traveling users, and many more features.

Mercury Systems
5111 MacIntercomm \$78.

Stuffit Deluxe & Stuffit SpaceSaver

Only Stuffit Deluxe 3.0 can solve all your compression needs from archiving to transparent compression. Stuffit will save you time and money on file transfers over your modem or network. It's the standard for all electronic services and the most efficient compression product available. Also includes Stuffit SpaceSaver. Unlike other compression products, Stuffit SpaceSaver increases disk space with lightning speed and without effort on your part. Direct it to work while your Mac is idle or when you request. SpaceSaver is the least expensive, most productive, and easiest-to-use compression product.

Aladdin Systems
4971 Stuffit Deluxe \$68.
4969 Stuffit SpaceSaver \$38.

SONY Data Media

Save your data with confidence. SONY brings you innovative products to protect your information. Diskettes, data cartridges, and magneto optical disks give you durability and reliability. Call Mac's Place to learn more about all the SONY products to meet your needs.

SONY
5612 3.5" DD Color 10-pack \$10.
3090 3.5" HD 10-pack \$15.
3687 Data Grade 90M 2 GB DAT Tape \$22.
4474 MO Rewritable 650MB 5.25" \$138.

Disk Café

If you use drives from different manufacturers, you need to format them all with the same utility. Disk Café is a complete storage formatting utility that works with nearly every drive available. So it can prevent compatibility problems including data loss. And its advanced diagnostic tools detect and repair disk defects.

Bering Industries, Inc.
5121 Disk Café \$45.

IT'S EASY TO ORDER!

ORDERING INFORMATION

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- Fax your order to 206-881-3090.
- Mail your order to 8461 154th NE, Redmond, WA 98052.
- For electronic orders, use Compuserve (76635.660), Genie (MACSPAC), or America Online (Mac's Place).
- Mac's Place uses CE Software's QuickMail to check our mail regularly.

ORDERING HOURS

- Mac's Place is open from 6 a.m. to 10 p.m. M-F Pacific Standard Time, and 6 a.m. to 6 p.m. on weekends.
- (For you East Coasters, this means you can call us until 1 a.m. weekdays and still receive your in-stock item that morning!)

PAYMENT OPTIONS

- VISA, MasterCard, American Express, OPTIMA, and Discover Card gladly accepted.
- Your credit card is never charged until your product ships.
- Most personal and company checks are approved quickly to ensure immediate shipment. For non-standard checks and checks over \$1,000, allow ten working days for clearance.
- Government, school, and institutional P.O.s clear immediately. Corporate P.O.s are subject to credit approval for first order.

SHIPPING INFORMATION

- All in-stock items ship same-day (barring system failure, etc.) to your doorstep, for just \$3 (USA) via


Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail. Our \$3 shipping charge includes insurance at no extra charge.

- When a partial order is shipped, we pay freight on additional shipments.

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- Call 206-883-8312 for our international sales line.
- We ship throughout the free world via Airborne Express International.
- International orders will be charged full shipping rates.
- Mail, fax, or electronic orders gladly accepted.

RETURNS

- All products carry a 120-day limited warranty from Mac's Place.
- Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion.
- Some hardware items carry one-, two-, or five-year warranties.
- Products with the  symbol carry a manufacturer's 30- or 60-day Money Back Guarantee.

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GamePad Mac

Perfect for all Mac games. Use the thumb-operated pad as a mouse on "point-and-click" games. The keystroke option gives you directional control for "keyboard only" games. Or screw in a joystick for hand-held control. Set-up is a breeze. Works on Macs from the SE to Quadra, including PowerBook.

Advanced Gravis

5172 GamePad Mac \$34.

Bernoulli MacTransportable 90 PRO

Get all the storage reliability you'd expect from Bernoulli for 40 percent less! The new MacTransportable doesn't require an interface kit. Everything you need to get up and running is in the box including a 90MB cartridge. Ask about the **NEW** Bernoulli MacTransportable 150.

IOEWA

5012 Bernoulli MacTransportable 90 PRO \$499.

5609 Bernoulli MacTransportable 150 Call.

Lemmings

Lemmings for the Mac has arrived! Now Mac owners can demonstrate their game playing smarts and test their sanity, saving mobs of imperiled green-haired rodents from certain doom. Lemmings for the Mac brings you 120 levels of original and intellectually challenging gameplay.

Psygnosis

5459 \$35.

TimesTwo

TimesTwo actually makes your hard disk bigger rather than making your files smaller! A one-time installation converts your hard disk to twice its original size in minutes, leaving your data unchanged. It's completely compatible with all Mac software and works with all SCSI and erasable optical disks.

Golden Triangle

5233 TimesTwo \$99.

M4 Tank Simulator

You and your buddies go for a ride. Only it's WWII, it's a long way to Germany, and your ride is on an M4 Sherman tank. Full color, sound, and voice-commands give this authentic simulation a dramatic realism.

Deadly Games

5360 M4 Tank Simulator (w/headphones, color) \$34.

3895 Battle of Britain II (color) \$34.

3894 Bomber 2 (w/headphones) \$31.

Virex

Virex detects and repairs files infected by all known Mac viruses. Then it prevents infection by continuously monitoring files and performing instantaneous repairs. It also keeps your network virus-free with scheduled virus scans. Virex is updated frequently to combat new viruses, and all registered users receive one free update.

DataWatch

5234 Virex 4.0 \$62.

5235 Virex 4.0 10 Pack \$428.

Universal PowerCache Card

Award-winning PowerCache is a 68030 CPU accelerator that offers speed increases from 200% for a IIci to 1,000% for a Mac Classic. Universal PDS design supports 14 Macs, leaves NuBus slots empty. Guaranteed 100% compatible running at full speed. Adapters (required for most installations) may be swapped with DayStar at no charge.

Classic and SE users may purchase adapters that support monochrome monitors.

DayStar Digital

3744 PowerCache 50MHz w/FPU \$1398.

Call for complete pricing on all DayStar Digital products.

Power Merge

Make sure you're working on the latest version of your files when using a PowerBook and a desktop Mac with PowerMerge. It's the first software that not only tells you where the latest version resides - it puts all versions in sync. It includes conflict notification, a history log, and updating via network or removable media.

Leader Technologies

5010 PowerMerge \$79.

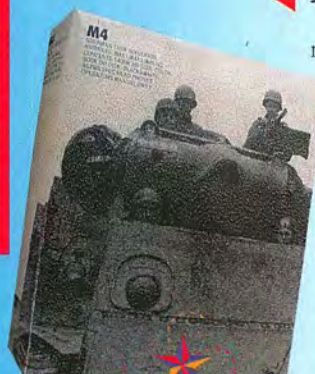
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Microsoft Word 5.1

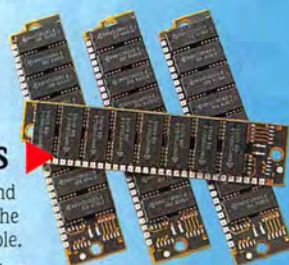
Upgrade to Microsoft's newest Word, and get more tools that make every day easy. Just click buttons on the new unique customizable toolbar to do dozens of common tasks in one step – tasks like checking spelling, making envelopes, and adding bullets. Or change the buttons to best suit your own tasks.

Microsoft •

5567 Microsoft Word 5.1 \$294.
5571 Microsoft Works 5.1 version Upgrade \$124.

Expand the memory of your Mac! More memory means increased task processing and the ability to switch between several applications running at once. Also includes the Mac's Place installation manual, the most complete SIMM installation guide available.

SIMMs



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SIMMs Call.

Atlas Pro

Import data from your spreadsheet or data management program and turn it into striking presentation-quality maps with Atlas Pro. It's an analysis tool that gives brilliant show-quality results. And it's bundled with a wealth of geographic data sets taken from the 1990 census, hundreds of digital maps, and lots of additional data.

Strategic Mapping Inc. •

5458 Atlas Pro \$498

CA-Cricket Graph III/CA-Cricket Draw III

With CA-Cricket Graph III, you can convert text or data into a complete, professional-looking graph in seconds. Choose from scatter, pie, area, and many other options. CA-Cricket Draw III is the object-oriented bezier drawing program for all ability levels. It includes Postscript support, full-featured text processing, and special text effects like rotation.

Computer Associates •

5001 CA-Cricket Graph III \$128.
4218 CA-Cricket Draw III \$168.



LapTrack for the Mac

Great for PowerBooks! Record time and expenses more easily than ever before – whether you're in the office or in the field. Reports include time and expense sheets, budgeting, productivity analysis reports and graphs. Address book feature allows you easy access to each client.

Timeslips Corp. •

5110 LapTrack \$52.
4096 Timeslips III V.2.1 \$192.
3312 Timeslips Accounting Link \$49.



Microsoft Works

Get the tools you need to combine words, numbers, and graphics any way you want. With a word processor, database with reporting, spreadsheet with charting, drawing, and communications, Works is the best-selling integrated software for the Mac. And now it's even better. Version 3.0 is faster, easier, better integrated, and runs on all Macs, including the PowerBook.

Microsoft •

5068 Microsoft Works version 3.0 \$159.
5071 Microsoft Works version 3.0 Upgrade \$79.

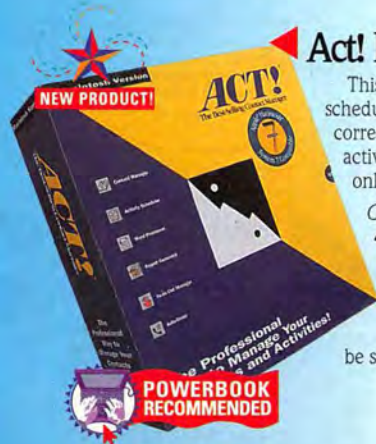


Act! For The Mac

This unique, integrated contact and calendar management solution handles your hectic schedule. Act! schedules calls, meetings, and to-do's; generates a variety of written correspondence; and automatically remembers every detail about each contact and activity. If you're using another planning or contact program, you can switch to Act! for only \$89! Call for details about the Competitive Trade-up offer.

Contact Software •

4970 Act! For The Mac \$258.
5592 Act! Competitive Trade-up \$89.



Hayes for the Mac

HayesConnect-Network serial device sharing software allows any serial device to be shared over a network from a server. SmartCom II V.3.3 – the most reliable easy-to-use Mac communication software. Ask about the \$40 manufacturer's rebate offer!

Hayes Microcomputer Products

1628 SmartCom II V.3.3 \$83.
4314 Hayes Connect \$74.



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Hayes

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5970...Optima 96 145
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5024...Ultra 144 599
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Ultra 96 Bundle

The Ultra 96 is a networkable modem with V.32, V.42, V.42bis, MNP5 and comes with Smartcom II and Hayes Connect software.

\$649

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7870... Radius Rocket 33 mHz 2199
2888... RocketShare 439

TransWarp LC

40MHz 68030 with Math Coprocessor
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3317... TransWarp SE 40 MHz 1119
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8719... EtherPrint 339
2540... DaynaPort EII/10Base-T 149
3667... DaynaPort SCSI Link 10Base-T 269
5363... TRX 10-T FriendlyNet Adapter 87

Farallon 20
2203... PhoneNet Plus Din 8 Connector 31
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4938... EtherMac NuBus Card 159

Shiva 20
6555... LanRover/L 599

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4725... Aldus PageMaker 4.2 95
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1503... Microsoft Word 5.1 125
5237... Microsoft Excel 4.0 95
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NEC
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4146... CD Express/CDR25 429

CD Technology
8057... Porta-Drive CD ROM 579

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6917... Netmodem v.32 9600 1039
2004... Netmodem/Ethernet (10Base-T) 1479

Logicode Technology
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5525... Quicktel Xeba M9624XV 149

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7562... PowerBook Battery 62

Connectix 20
8441... CPU PowerBook Utilities 49

Dayna Communications 20
5396... DaynaPort SCSI/Link (thin) 299
5414... SCSI/Link-3 (thick, thin, 10Base-T) 325

E-Machines
10323... PowerLink Desknet 10T (PB Dock) 609

Envisio
1848... PowerBook Display Adapter 629
2411... ColorBook 16 (2 MB) 949

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1118... Compact PowerBook Case 49
5976... PowerBook Key Pad 99

PSI Integration 20
5320... PowerModem 155
6961... PowerModem II 235
7798... PowerModem III 329
7786... PowerModem IV 425

Sophisticated Circuits 20
7425... PowerPad 79

Utilitron 20
3012... PowerSwap 25
7603... PowerBakPak Case 74

Global Village

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7720... PowerPort Silver V.42bis Fax 369
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PowerPort Gold

Internal fax modem for the PowerBook featuring: 14,400 bps data and 9600 send/receive fax, V.32bis, V.42bis, and MNP 2-5.
\$429
#7710

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PRODUCT INDEX

ADVERTISER

PAGE

Database Management

Helix Technologies 800-364-HELIX 221, 223, 225

Display Systems & Video

E-Machines 800-344-7274 152-153
MacNews 800-243-9383 327
Mirror Technologies 800-643-3372 20-21
Mobius Technologies, Inc. 800-800-4334 7, 9
NEC Technologies 800-NEC-INFO Covers 5-8
NoRad 800-262-3260 14
RasterOps 800-SAY-COLOR 17

Education

Educational Resources Ltd. 800-624-2926 99
MacAcademy 800-527-1914 209

Financial Management

ChipSoft 800-964-1040 ext. 3130 253
Teleware, Inc. 800-322-MYOB (6962) 89

General Hardware & Accessories

Hardware That Fits 800-364-LESS 136-145
Kensington 800-535-4242 248
Lind Electronic Design 612-927-6303 193
Moustrak 800-221-6687 267
Outbound Systems, Inc. 800-444-4607 203
RealTech 800-864-REAL 105, 107, 109, 111
Verbatim Corporation 704-547-6500 224
Zeos International Ltd. 800-824-5565 260

Graphics & Design

Apple Computer, Inc. 59
Deneba Software 305-596-5644 15
Eastman Kodak 800-242-2424 ext. 56 48-49
Electronics For Imaging 800-285-4565 205
Fractal Design Corporation 408-688-8800 6
GraphSoft 410-461-9488 216
Image Club Graphics Inc. 800-661-9410 98
Specular International 413-549-7600 252

Mail Order

Advance Business Center 800-274-7747 332-333
Apple Computer, Inc. 800-795-1000 ext. 500 88
Bottom Line Distribution 900-420-3737 285-287
CallSoft 800-777-5014 292
Diskette Connection 800-654-4058 304
Dr. Mac 800-825-6227 278-279
Express Direct 800-535-3252 314-315
First Source International 800-535-5892 334
Hard Drives International 800-998-8024 302
La Cie Limited 800-999-1337 319-326
Mac Depot 800-222-2808 328-331
Mac & More 800-945-1MAC 316
Mac Zone, The 800-248-0800 32-39
Mac's Place 800-367-4222 293-299
MacCenter 800-950-3726 306-307
MacConnection 800-800-4444 78-85
MacDirect 800-621-8469 231
MacFRIENDS 800-331-1322 241, 244, 259
MacLand 800-333-3353 282-283
MacProducts, USA 800-622-3475 290-291
MacTown 800-338-4273 318
MacWarehouse 800-255-6227 118-123
Maya Computer 2.0 800-998-0093 300-301
Mirror Technologies 800-643-3372 20-21
Mirror Technologies 800-643-3369 69
Port Computer Brief Cases 800-242-3133 313
Softdirect 800-800-2220 284
Third Wave Computing 800-448-0404 280-281
TigerSoftware 800-666-2562 276-277
USA Flex 800-950-0354 308

Networking & Connectivity

Asanté Technologies 800-662-9686 22
Dayna 801-531-0600 ext. 531 232
Farallon 800-949-7761 234
Focus Enhancements 800-538-8866 86
Lotus 800-448-2500 201
Pacer Software 800-PACER-02 66
TechWorks 800-879-7745 30

Organizational Tools

AEC Software 800-346-9413 4
Clarix Corporation 800-3CLARIS 63

ADVERTISER

PAGE

Helix Technologies 800-36-HELIX 214
Kaetron Software Corporation 713-890-3434 77
Mainstay 818-991-6540 274
Microsoft Cover 2, 1

Output Devices

CoStar 800-4-COSTAR 246
Dataproducts Corporation 800-334-3174 70
DEC 800-DEC-INFO 213
Hewlett-Packard 800-552-8500 ext. 7119 5
Hewlett-Packard 800-527-3753 ext. 7135 10-11
Hewlett-Packard 800-35HPMAC ext. 7037 128-129
LaserMaster Corporation 800-950-6868 25
NEC Technologies 800-NEC-INFO 65
NewGen Systems 800-756-0556 191
QMS, Inc. 800-392-7557 76
RealTech 800-864-REAL 105, 107, 109, 111
SuperMac 800-334-3005 40
Tektronix 800-835-6100 Dept. 18A 43
Texas Instruments 800-527-3500 96-97
XANTE Corporation 800-926-8839 263

Performance Enhancers

Applied Engineering 800-554-MACS ext. 559 187
DayStar Digital 800-962-2077 44
TechWorks 800-866-2785 167

Resources

CompuServe 800-848-8199 31
Safeware 800-848-3469 334

Scanners

Hewlett-Packard 800-35HPMAC ext. 7037 128-129
Microtek Lab, Inc. 800-654-4160 256
UMAX Technologies 800-562-0311 222

Spreadsheets & Numerical Analysis

Delta Point, Inc. 800-446-6955 ext. 105 90
Lotus 800-488-2500 26-27
Mathsoft 617-577-1017 95

Storage Systems

APS Technologies 800-235-2750 270-273
Chinon America, Inc. 800-441-0222 19
ClubMac 800-854-6227 288-289
dgrTechnologies, Inc. 800-235-9748 303, 305
Direct Tech 800-279-5520 304
ETC Peripherals 800-876-4ETC 317
FWB Inc. 415-474-8055 56
Microtech International Inc. 800-325-1895 150
Mirror Technologies 800-643-3369 69
O.C.E.A.N. Microsystems, Inc. 800-944-6232 334
Panasonic 800-742-8086 72
PLI 800-288-8754 185
Procom Technology 800-800-8600 8
Storage Dimensions 408-954-0710 12

Telecommunications

Prometheus Products, Inc. 800-477-3473 183
Supra 800-944-8772 250-251

Utilities

Aladdin Systems, Inc. 408-761-6200 94
Berkeley Systems 510-540-5535 18
ColorAge, Inc. 800-4FREEDOM 227
Connectix Corporation 800-950-5880 158
Dantz Development Corp. 510-849-0293 88
DataViz, Inc. 800-733-0030 254
Datawatch 919-490-1277 24
Dubi-Click 800-266-9525 68
Fifth Generation Systems, Inc. 800-666-2904 28
Golden Triangle 800-326-1858 165
Insignia Solutions 800-848-7677 242
Leader Technologies 800-922-1787 64
Maxa Corporation 800-788-6292 98, 189
No Hands Software 415-321-7340 16
Now Software 800-237-3611 264
Software Security 203-329-8870 42
Symantec Corporation 800-343-4714 ext. AF15 175
Symantec Corporation 800-554-4403 207
Teknosys 800-873-3494 74

Word Processing

Microsoft 60-61
Nisus Software, Inc. 800-922-2993 ext. 93 226

AD INDEX

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RS#	ADVERTISER	PAGE	RS#	ADVERTISER	PAGE
176	Advance Business Center	332-333	167	Mac's Place	293-299
100	AEC Software	4	83	MacAcademy	209
17	Aladdin Systems, Inc.	94	1	MacCenter	306-307
N/A	Apple Computer, Inc.	59	N/A	MacConnection	78-85
N/A	Apple Computer, Inc.	88	240	MacDirect	231
85	Applied Engineering	187	N/A	MacFRIENDS	241
146	APS Technologies	270-273	N/A	MacFRIENDS	244
209	Asanté Technologies	22	N/A	MacFRIENDS	259
N/A	Berkeley Systems	18	150	MacLand	282-283
N/A	Bottom Line Distribution	285	166	MacNews	327
N/A	Bottom Line Distribution	286-287	137	MacProducts, USA	290-291
214	CallSoft	292	237	MacTown	318
134	Chinon America, Inc.	19	156	MacWarehouse	118-123
N/A	ChipSoft	253	76	Mainstay	274
N/A	Clarix Corporation	63	107	Mathsoft	95
46	ClubMac	288-289	239	Maxa Corporation	93
91	ColorAge, Inc.	227	86	Maxa Corporation	189
120	CompuServe	31	154	Maya Computer 2.0	300-301
62	Connectix Corporation	158	N/A	Microsoft	Cover 2, 1
88	CoStar	246	N/A	Microsoft	60-61
28	Dantz Development Corp.	88	160	Microtech International Inc.	150
116	Dataproducts Corporation	70	180	Microtek Lab, Inc.	256
172	DataViz, Inc.	254	118	Mirror Technologies	20-21
75	Datawatch	24	90	Mirror Technologies	69
132	Dayna	232	173	Mobius Technologies, Inc.	7
159	DayStar Digital	44	174	Mobius Technologies, Inc.	9
N/A	DEC	213	122	Moustrak	267
43	Delta Point, Inc.	90	212	NEC Technologies	65
186	Deneba Software	15	204	NEC Technologies	Covers 5-7
114	dgrTechnologies, Inc.	303	211	NEC Technologies	Cover 8
175	dgrTechnologies, Inc.	305	31	NewGen Systems	191
33	Direct Tech	304	32	NewGen Systems	191
125	Diskette Connection	304	N/A	Nisus Software, Inc.	226
37	Dr. Mac	278-279	74	No Hands Software	16
92	Dubl-Click	68	148	NoRad	14
153	E-Machines	152-153	170	Now Software	264
171	Eastman Kodak	48-49	205	O.C.E.A.N. Microsystems, Inc.	334
112	Educational Resources Ltd.	99	79	Outbound Systems, Inc.	203
72	Electronics For Imaging	205	108	Pacer Software	66
41	ETC Peripherals	317	131	Panasonic	72
144	Express Direct	314-315	66	PLI	185
178	Farallon	234	77	Port Computer Brief Cases	313
106	Fifth Generation Systems, Inc.	28	123	Procom Technology	8
64	First Source International	334	58	Prometheus Products, Inc.	183
126	Focus Enhancements	86	143	QMS, Inc.	76
24	Fractal Design Corporation	6	N/A	RasterOps	17
81	FWB Inc.	56	97	RealTech	105
111	Golden Triangle	165	96	RealTech	107
208	GraphSoft	216	95	RealTech	109
N/A	Hard Drives International	302	94	RealTech	111
199	Hardware That Fits	136-145	61	Safeware	334
246	Helix Technologies	214	233	Softdirect	284
67	Helix Technologies	221	216	Software Security	42
68	Helix Technologies	223	87	Specular International	252
69	Helix Technologies	225	164	Storage Dimensions	12
N/A	Hewlett-Packard	5	136	SuperMac	40
N/A	Hewlett-Packard	10-11	70	Supra	250-251
N/A	Hewlett-Packard	128-129	N/A	Symantec Corporation	175
89	Image Club Graphics Inc.	98	N/A	Symantec Corporation	207
155	Insignia Solutions	242	105	TechWorks	30
98	Kaetron Software Corporation	77	104	TechWorks	167
99	Kaetron Software Corporation	77	49	Teknosys	74
130	Kensington	248	40	Tektronix	43
210	La Cie Limited	319-326	129	Teleware, Inc.	89
179	LaserMaster Corporation	25	168	Texas Instruments	96-97
44	Leader Technologies	64	140	Third Wave Computing	280-281
45	Lind Electronic Design	193	139	TigerSoftware	276-277
N/A	Lotus	26-27	145	UMAX Technologies	222
N/A	Lotus	201	245	USA Flex	308
53	Mac Depot	328-331	162	Verbatim Corporation	224
42	Mac & More	316	225	XANTE Corporation	263
235	Mac Zone, The	32-39	222	Zeos International Ltd.	260

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 051 052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085 086 087 088 089 090 091 092 093 094 095 096 097 098 099 100
 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
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1. For how many micro computers do you buy products?
(check one)
☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/General Management ☐ 03) Engineering/R&D
☐ 02) MIS/DP, Communications ☐ 04) Finance/Accounting
☐ 05) Marketing/Sales Systems, Programming ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE	03	04
Accounting	<input type="checkbox"/> 01	<input type="checkbox"/> 01
Spreadsheets	<input type="checkbox"/> 02	<input type="checkbox"/> 02
Project Managers	<input type="checkbox"/> 03	<input type="checkbox"/> 03
Word Processors	<input type="checkbox"/> 04	<input type="checkbox"/> 04
Database Managers	<input type="checkbox"/> 05	<input type="checkbox"/> 05
Graphics	<input type="checkbox"/> 06	<input type="checkbox"/> 06
Integrated Software	<input type="checkbox"/> 07	<input type="checkbox"/> 07
Communications	<input type="checkbox"/> 08	<input type="checkbox"/> 08
Utilities	<input type="checkbox"/> 09	<input type="checkbox"/> 09

HARDWARE

☐ 10 Modems
☐ 11 Scanners
☐ 12 Microcomputer
☐ 13 Printers/Plotters
☐ 14 Monitors/Displays
☐ 15 Storage
☐ 16 Add-in Boards
☐ 17 Networking

03	04
<input type="checkbox"/> 10	<input type="checkbox"/> 10
<input type="checkbox"/> 11	<input type="checkbox"/> 11
<input type="checkbox"/> 12	<input type="checkbox"/> 12
<input type="checkbox"/> 13	<input type="checkbox"/> 13
<input type="checkbox"/> 14	<input type="checkbox"/> 14
<input type="checkbox"/> 15	<input type="checkbox"/> 15
<input type="checkbox"/> 16	<input type="checkbox"/> 16
<input type="checkbox"/> 17	<input type="checkbox"/> 17

5. If so, what function do you serve in the buying process?
(check all that apply)
☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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Systems, Programming ☐ 06) Computer Dealer/VAR

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Accounting ☐ 01 ☐ 01
Spreadsheets ☐ 02 ☐ 02
Project Managers ☐ 03 ☐ 03
Word Processors ☐ 04 ☐ 04
Database Managers ☐ 05 ☐ 05
Graphics ☐ 06 ☐ 06
Integrated Software ☐ 07 ☐ 07
Communications ☐ 08 ☐ 08
Utilities ☐ 09 ☐ 09

HARDWARE

Modems
Scanners
Microcomputer
Printers/Plotters
Monitors/Displays
Storage
Add-in Boards
Networking

Q3 Q4
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
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☐ 16 ☐ 16
☐ 17 ☐ 17

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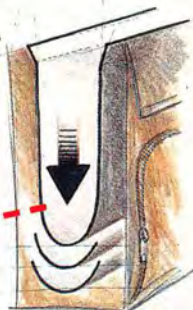
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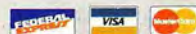
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127MB	ELS127/19MS	\$ 339	\$ 409
170MB	ELS170/19MS	\$ 399	\$ 469
120MB	LPS120/10MS	\$ 349	\$ 419
240MB	LPS240/10MS	\$ 625	\$ 724
425MB	PRO425/10MS	\$ 999	\$1079

Quantum drives feature 100,000-200,000 hrs MTBF and a two year warranty.

Seagate

Capacity	Description	Internal	External
248MB	ST3283N/12MS	\$ 515	\$ 585
426MB	ST1480N/14MS	\$ 825	\$ 899
525MB	ST1581N/14MS	\$ 999	\$1069
663MB	ST4766N/15MS	\$1159	\$1309
676MB	ST4767N/12MS	\$1399	\$1599
1050MB	ST41200N/15MS	\$1399	\$1625
1352MB	ST41600N/12MS	\$1849	\$2025
1900MB	ST42100N/12MS	\$1899	\$2075
2100MB	ST42400N/11MS	\$2749	\$2999
2750MB	ST43400N/11MS	\$4250	\$4399

Seagate drives feature one year warranty. Internal full-height drives for the MACII, IIFX and the Quadra 900/950 only.

TAPEBACKUP SYSTEMS

Capacity	Description	Internal	External
155MB	Teac	\$ 409	\$ 479
250MB	WangTEK	\$ 529	\$ 599
525MB	WangTEK	\$ 799	\$ 875
600MB	Teac	\$ 599	\$ 669
2.0GB	WangDAT	\$1419	\$1489
2.2GB	Exabyte-8200		\$1849
5.0GB	Exabyte-8500		\$2799

All tape backup external kits come complete with software, external SCSI cable and one tape. Internal kits compatible with Quadra 900/950 models only.

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- ☒ **Quantum quality under the hood!** For high-speed performance and reliability Quantum mechanisms are simply the best you can buy. As a Quantum company, La Cie proudly offers a full range of Quantum drives.
- ☒ **Award-Winning Design!** They don't pack a Porsche engine in a Chevy body. Neither do we. La Cie's award-winning Cirrus and Tsunami cases are sleek, streamlined, space-saving. They not only look sexy, they're actually smaller than conventional zero-foot-print cases.
- ☒ **Award-Winning Performance!** Check the record books. Year after year, the experts rate La Cie tops. In the race for Macworld's 1992 World Class Awards, La Cie won Best Hard Drive under 80MB, Best Hard Drive 80-200MB, Best Hard drive over 200MB, and Best Color Scanner.
- ☒ **Unlimited, toll-free, no-fee tech support!** No drive or scanner is worth its salt without it! That's why La Cie doesn't limit telephone technical support. Call as often as you need on our FREE 800 number. It's no-extra-charge.
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- ☒ **Unique switchable on/off termination.**
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- ☒ **All La Cie products are FCC, UL, TUV, VDE, CSA certified.** Uncertified equipment can be unsafe. Products sold without FCC certification are even illegal. Yet, non-certified equipment is sold every day. Check certification before you buy, to make sure no one sells it to you. We also burn in every drive for 24 hours for your protection.
- ☒ **La Cie is a real manufacturer—not just a reseller.** You learn a lot when you manufacture your own products. What works. What doesn't. And why. That's why we're never stumped for an answer when you need help. That's why—by anticipating problems—we can avoid them. And that's why our customers are bowled over with our service and support—not just blown off.

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La Cie's DAT drives can backup without making you go in reverse.

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For even higher revving capacity tape back-up for your Mac look at our La Cie Compression DAT Drive! With up to 8GB of storage on each 4mm cassette, our jumbo capacity Compression DAT drive offers true computer grade performance and reliability—not to mention ARDAT technology, and industry-standard DDS-DC data compression.

The La Cie advantage.

Like every La Cie product we sell, our tape drives are feature rich. Engineered within our award-winning Cirrus case, each comes complete with universal power supply, half-speed fan, SCSI cable and power cord, free tape cartridge, Retrospect™ software and our exclusive on/off termination switch.

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100MB LPS (3 1/2")	\$349	\$449	\$469	\$499
120MB (3 1/2")	\$399	\$499	\$519	\$549
127MB ELS (3 1/2")	\$369	\$469	\$489	\$519
170MB ELS (3 1/2")	\$419	\$519	\$539	\$569
240MB LPS (3 1/2")	\$649	\$749	\$769	\$799
425MB Maui (3 1/2")	\$949	\$1049	\$1069	\$1099
525MB LPS (3 1/2")	\$1169	\$1269	\$1289	\$1319
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1.05GB PD (3 1/2")	\$1899	\$1999	\$2019	
1.2GB PD (3 1/2")	\$1919	\$2019	\$2039	
80MB (2 1/2") for Powerbook	\$399	See PocketDrive		
120MB (2 1/2") for Powerbook	\$499	See PocketDrive		

Seagate	Internal	ZFP+	HP	Internal	ZFP+
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1.2GB (5 1/4")	\$1749	\$1899	1.2GB (5 1/4")	\$1989	\$2139
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600MB Tape Drive	\$699	\$799
1.3-2.0GB DAT	\$1249	\$1349
4-8GB DAT	\$1549	\$1649



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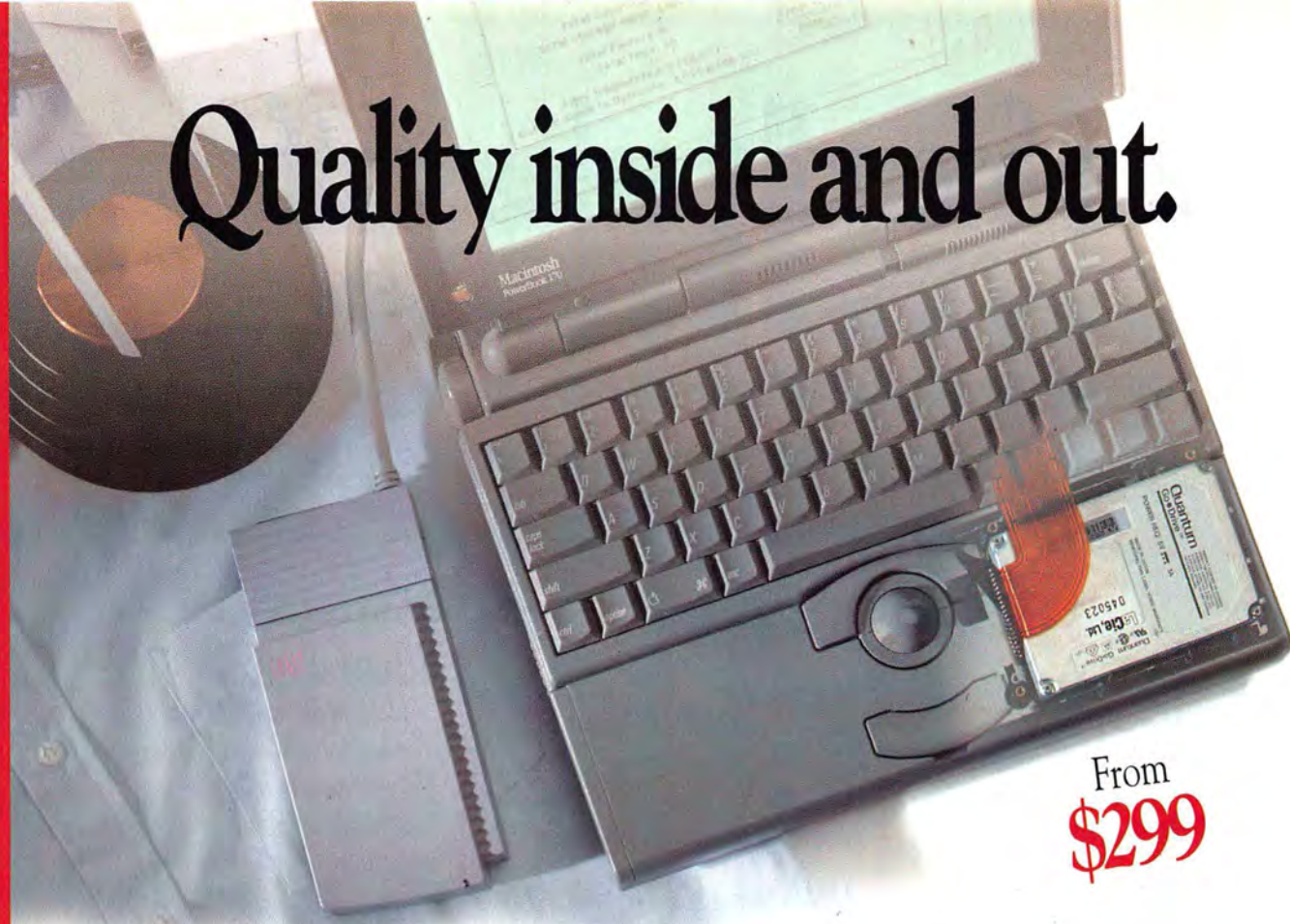
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Data Recovery Services
Disk Drives
Diskettes
General
Input Devices
Insurance
Memory Upgrades
Networking
Peripherals
Power Supplies
Printers
Scanners
Security
Tape Drives
Used Equipment

PREMIER

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CLASSIFIED

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Back Up Systems
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Personal Management
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Recreation
Religion
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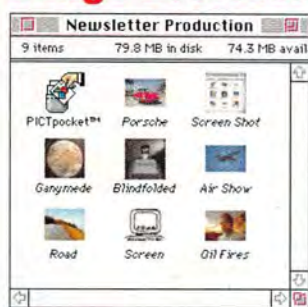
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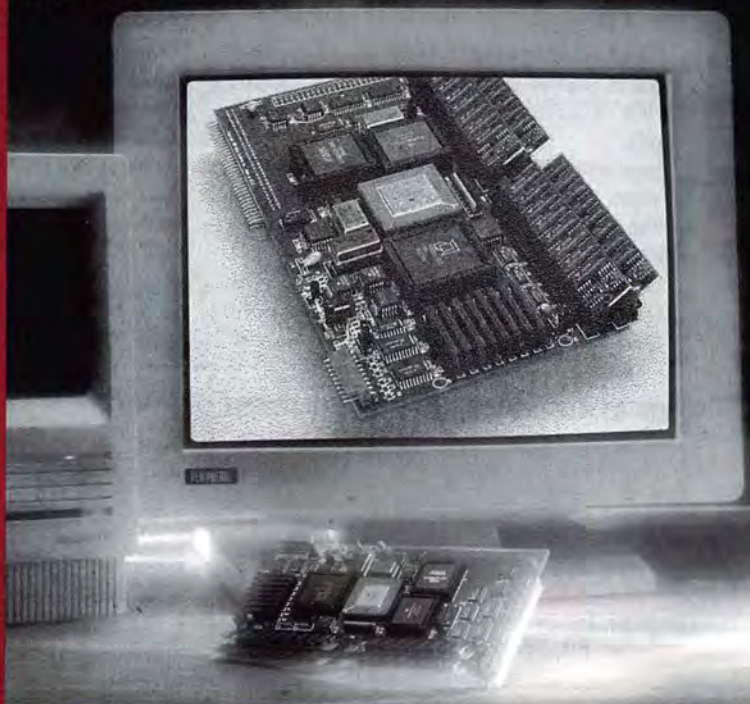
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Surviving a Crash Crunch



Upgrading to System 7 and Apple's latest hardware is fine — unless you want your software to work.



OK, some people say I've gotten soft. There's nothing like a dose of reality to change that. So I decided to upgrade my trusty old Mac IIx to a Quadra 700 running System 7. Although I'd toyed with System 7 for writing *Dvorak's Inside Track to the Mac*, I'd put off upgrading — mostly because my wife complained that some programs didn't work under it.

In fact, *lots* of programs didn't work. Programs like Microsoft Word! In fact, both WriteNow and Word didn't work but Claris' MacWrite worked fine. This amused me because Microsoft was recently accused of writing Windows update code that made non-Microsoft products crash. Gee, I wonder who got the idea first? (Since then, I've received updates for all the word processors, and they do indeed work.)

As for the Quadra, it's a fine piece of hardware, no question. But throw some old Mac software at it, and it crashes at the drop of a hat. It's good to know that Apple hasn't lost its knack for making equipment with limited backward compatibility. This is good marketing. It forces you to update everything and keep the economy going. *Not!*

Many of these crashes result in a dead machine that needs to be turned off manually. Newer software tells you that you have a Type 1, Type 2, or Type 3 error and provides no further explanation. I'm aware that some patches are floating around the bulletin boards that correct this problem, but my telecom program doesn't work (Type 1 error), so I can't download them!

Some of the crashes and wacky messages are downright funny. I tried to run a program called TLP Navigator and immediately got a message box saying, "Expected long integer but found something else," with the options Cancel and Script, neither of which did a damn thing except close the box. And I still wonder what the "something else" was that the system found. Anyway, when I tried to quit the application, the same message appeared on the screen, making it impossible. Hey guys, look at OS/2 on the PC to see how this should be done. Anyway, I couldn't figure out the Cancel/Script option, so I turned on Balloon Help. Of course, as anyone familiar with Balloon Help knows, it told me *nothing* about either message. All it did was remind me how useless Balloon Help is.

Another screwball anomaly occurs when you attempt to use an old program such as


MacPaint 1.5. (Yes, I started to experiment!) The old MacPaint program starts up and appears, but the mouse buttons and all input die (although you can move the cursor around). Try to quit, and it can't be done. Reboot time.

Seventh-System Kvetch

Of course, solving these problems is easy: Buy new software. But there are some other, more general problems with the Mac and System 7 that need to be solved. Let's start with color settings. With the Mac, I've never seen so much software that stops and tells you to reset the colors. What's the deal here anyway? A program requires that you set the machine to 16 colors, black-and-white, or 256 colors. The program stops and you have to do this manually in the Monitor control panel. Come on, this really sucks — it's the most annoying feature of the Mac. Yeah, I know there are some patches to correct this, but why doesn't Apple take care of it?

While we're on the subject of color control, has anyone ever wondered why the Color control panel doesn't really control the color? To change from 16 colors to 256 colors, you open the Monitors control panel. Give me a break — the monitor isn't doing anything different! This has always bugged me. And what's this "millions" thing listed in the Color, excuse me, Monitors control panel's menu? Can't we be more exact or use the word *full* for full color, which is 16,777,216 or so? Sheesh, the way things are headed, the menu will someday read "bunch o' colors."

I admit that System 7 is probably an improvement, although I think the folders within folders within folders and all the various control panels are annoying. I liked it better when there was just one big bin into which you tossed the files.

All these annoyances will be worked out soon, I'm sure. Everyone tells me that System 7.1 is a lot better. But why is Apple asking \$40 for this upgrade when its policy has never been to charge for minor system upgrades? I'm reminded of the Lexus dealerships around the country. Take a Lexus in for service, and you get a free loaner while they wash and detail your Lexus. This is so the public sees clean, good-looking, well-maintained Lexi and maybe will want to buy one too. Apple should think in these terms with System 7.1 — it's good for its image to have everyone upgraded and happy. How about it, Mr. Sculley? 

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